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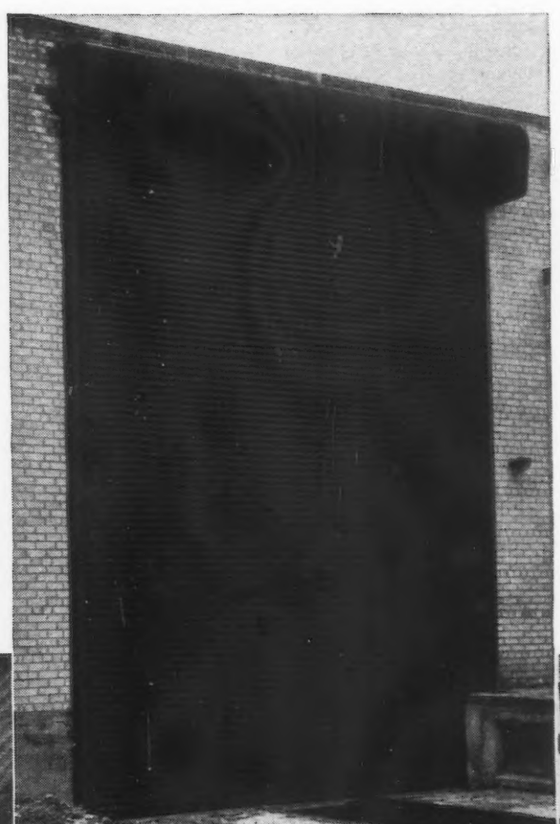

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The Consumer and Machinery

IMPROVEMENT in machinery for production is the strongest safeguard against inflation. If you don't believe it, look back with me to what things cost a half century ago, as compared to now.

When I was a boy a haircut cost 25¢, without a tip, and it was mostly without. Today you pay anywhere from 75¢ to $1.00 for the same service; certainly no better in any respect. The method and tools employed today are exactly the same as those used then; scissors and clippers have not changed much in the last half century any more than has barbers' conversation, which has always been thrown in free.

In those early days, in fact 40 years ago, I rented a new house, seven rooms, electric lights, hardwood floors, modern plumbing and other conveniences for $18.00 per month. Today you would have to pay at least $60.00 for the equivalent, even under OPA ceilings. Houses today are built, at least most of them, by exactly the same hand methods, with hammers and saws as the principal tools.

Back in the 1890's, we paid a nickel for a quart of milk and it was darn good rich milk too. Today you fork up 19¢ for a similar amount of poorer quality if you happen to live in or near New York City. Turning grass into lacteal fluid via the cow is accomplished by the same process now as then. True, the milking process has been speeded up somewhat by mechanization but it has not become a universal practice. It still takes as many chews of cud to turn out a quart as it did 50 years ago.

Fifty years ago you could have a baby delivered at your home for $15.00 and "doc" was glad to get it on the installment plan of 50¢ a week. Today it costs you $100, without the hospital bill, yet the process of production remains virtually unchanged.

"Well," someone says, "look how much higher wages are today. Doesn't that account for it?"

No, it doesn't.

Wages in the electrical industry for example, have risen as much as or more than they have in the occupations cited. Yet in spite of wages, taxes, slowdowns and shutdowns, the housewife today can buy an incandescent lamp bulb for about one fourth as much as she had to pay even as late as 10 years ago and better electric refrigerators are coming off the line at half the price or less. Not to mention sizable reductions in electric motors for industrial purposes.

Wages as well as taxes have gone up in the automobile industry; yet today's cars at today's prices represent from 50 to 100 percent more quality and service value than those of 10 to 15 years ago.

Improved mechanization resulting in greater productivity per man-hour is the answer. Wherever you find an industry that utilizes mechanization constructively to benefit its workers and customers you will find the occurrence of this same process of making the consumer's dollar buy more. That is worth thinking about in these days of "devil take the hindmost."

Pouring ingot molds at Inland's Indiana Harbor Plant.

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► Plate glass looms as a coming bottleneck in automobile production. Soda ash, essential to glassmaking, is critically short and has already caused the shutdown of several chemical plants using it as an ingredient.

► Many automobile executives are predicting a new wave of strikes in Detroit shortly after Labor Day. A great deal depends on prices at that time.

► Martempering may be widely used by the auto industry to cut straightening expense, a costly item. There was a time when some plants were straightening every single pinion they made.

► Behind the ODT appeal for Saturday acceptance and unloading of freight shipments lies the fact that the railroad car supply situation is even more critical now than it was during the war. Box car loadings for the week ended June 29, 1946, were 6.6 pct above those for the week ended Aug. 11, 1945.

Vigorous action by the carriers has eased the supply to midwest mills for the present. Meanwhile the general situation is tight because the number of serviceable cars has dropped from 723,000 to 690,000 in a year's time.

► The government is demobilizing in reverse. Excluding the Army and Navy from the calculation, the peacetime civilian payroll increased 24,813 in May over April. Ironically, during the time it was being mauled in Congress the OPA payroll jumped 1066 to reach a total of 33,910.

► Kaiser-Frazer has given up on torsional springing. Reported explanation for the change is "manufacturing difficulties." This may mean engineering difficulties or cost problems. Truck manufacturers are still considering the application.

► Shortage of cereal binders is developing as a serious threat to casting production, particularly in production foundries using core blowing machines. The pressure is on to develop substitutes, urea being the current fair-haired boy. One plant is using rice flour successfully.

► Pig iron producers, concerned over rising costs and debating the amount of a price increase to charge, are afraid that if OPA remains defunct they may not legally be able to collect the increases which OPA made retroactive to May 29.

► During the war, the Germans developed a method for hardening synthetic spinel jewel bearings to the point where their performance approached that of synthetic sapphire bearings.

Spinel, a crystalline mineral softer than sapphire, was hardened by a process involving heating the spinel to a temperature of 1740° to 1920° F for 12 hr in order to convert it to a different alumina form.

► A system not unlike the statistical method of quality control has been applied to the determination of plant accidents. Indications are that this application has materially reduced the occurrence of industrial accidents.

► Wartime production featured huge rejections of cylindrical parts having tapered ends. Losses were so terrific they became serious bottlenecks. Often these rejects were due to attempts to cut the taper with a forming tool or a taper cutting tool actuated by the cross slide. The loss can usually be sharply reduced by using a tool which approaches along the long dimension of the taper, and cutting the taper so as to make it favor the required tolerances.

► The famous governmental "black list" which once contained 15,446 names branded as friendly to the enemy has been withdrawn primarily because Switzerland insisted upon it in return for the liquidation of Nazi assets.

► Philippine interests are endeavoring to organize a company in the States to underwrite development of new chrome ore properties in Luzon. According to preliminary surveys, it may run 48 pct, and is said to represent considerably larger potential tonnages than previously worked beds in that area. Some small lots of Philippine ores have already arrived.

► Despite talk of British high speed engines one of the latest English planes is an 8 to 11 passenger craft with a 160 mph cruising speed for which De Havilland reports export orders totaling $8 million.

► American steel can be laid down in Turkey for less than it can be bought from the local plant there.

► British experts privately say that the FBI did a far better job than Scotland Yard in protecting plants from sabotage during the war.

► Rolling mill machinery ordered by the Netherlands before the war and diverted to the Herman Goering works at Salzgitter is now en route to its original destination. The first shipment of 7,150 tons of mill machinery has reached Ijmuigen and the balance, 18 shiploads and 49 carloads, is on its way.

Fission at Bikini

(2) Bomb by Manhattan

By T. W. LIPPERT

Bikini, July 3:

TWO days ago, the awesome flash of the world's fourth atomic bomb low on the bright morning horizon of lonely Bikini atoll, encompassed within a few brief moments the climax of a military and publicity effort, the magnitude of which made all Hollywood super-productions—and the gush of superlatives habitually used to describe them—poor runners up.

To some, this transport of scores of observers from the world's four corners to the most isolated section of the Pacific Ocean had certain points of similarity with the first battle of Bull Run—a gala spectacle indeed, when thousands of "observers" in tasseled phaetons and gentlemen of the press on prancing steeds cluttered the road from the Federal City to the holocaust at Manassas 30 miles away. But, to others, it seemed frighteningly like an overture to world destruction, with the shaved, anointed and skivvie-shirted goat spread-eagled on the quarter-deck of the target ship Nevada merely a bewhiskered and dignified symbol of the observers peering through black goggles 20 miles away, the two separated merely by an all too brief time interval of several decades. And, to the military, the staging of Operation Crossroads, was just a realistic and exhilarating test of a new weapon in accordance with accepted professional principles, unfortunately complicated somewhat by easily-contained infiltration by some 140 newspaper and radio professionals with a propensity for homey yarns, scarehead dramatism and a mild inclination to probe around for innocuous but restricted information.

To this writer, it was a little of all three.

Twenty-four hours before the bomb drop, eastern Bikini lagoon was a sight to quicken any pulse. Its 250-sq-mile oval of clear blue water was alive with action. The 74 ships of the target array were centered at the eastern end of the lagoon, 6000 yd from the island of Bikini, largest of 20 islands scattered at varying intervals around the 65-mile rim of the lagoon. Dispersed within and around the target array were most of the 169 supporting ships of the task force, with small boats in restless motion transporting personnel and attending to a multitude of last-minute tasks.

Those ships of the target array bunched in the center were all double-anchored to prevent collision. Eyes turned again and again to the heroic veteran battleship *Nevada,* ablaze with brilliant brick-red and white paint, for she was the bull's eye for the fourth atomic bomb. Up to 800 yd from the *Nevada* the ship concentration was dense, beyond 800 yd and up to 1500 yd the distribution was much more open, and for some 500 more yards there were occasional radiating lines of LSTs, LCTs and APAs, so located not so much to test their ability to stay afloat but rather as platforms for instruments. The water near the *Nevada* was also cluttered with miscellaneous equipment, such as life rafts, small boats, and other floating gear, as well as many floating pressure, wave and radioactivity instruments from which stubby short-wave radio antennae protruded. All the ships were arranged in a peculiar way to minimize one's shielding another from the full blast intensity.

Not all the heavier capital ships were in the honor position near the Nevada. (See illustration.) It was desired that many survive for the second underwater test. Furthermore, even with the best of luck and ability the chances were against the bombardier's placing his drop at 30,000 ft in exactly its prescribed position, in an air burst directly over the *Nevada.* Included in the entire array were three more veteran U. S. and one Jap (the *Nagato,* complete with half-starved rats and charcoal braziers for keeping the crew warm) battleship, two U. S. and one Jap (*Sakawa*) and one German (*Prinz Eugen,* a real beauty) cruisers, two aircraft carriers, fourteen destroyers and eight submarines (several of the modern pressure-hull type). The remaining target vessels, some 44 in all, ranged all the way from attack transports to concrete-barge hulls. (Reinforced concrete structures at Nagasaki stood up better than steel in many instances.) Each Jap ship had as a consort a small barracks vessel to serve as living quarters for the standby crew, as Jap quarters and Jap rodents were somewhat more than American sailors could stomach.

As temporary and pampered guests on 22 of the target ships, were the living instrumentation—the 150 pigs, 150 goats, 1000 rats and a number of mice of high and low predilection to cancer. Some were tethered and some were caged and some were free to roam at will throughout a particular compartment. Their

distribution was such as to assure survival of most (at least temporarily), as dead animals would be of little use in subsequent examinations. Also presumably surviving would be most of the thousands of wild, half-starved rats ranging through many of the ships, bewildered by the strange alteration in their environment. With skins similar to the human, some of the goats were shaved, some clipped close, some covered with anti-flash creams, ointments, various protective clothing, etc. Later the ones suffering from blast, burn and radiation would be favored with the best of hospitalization, for they promised the means for accurate future diagnosis and the formulation of principles of therapy for Navy personnel.

As a sop of sorts to those purists in science who rightly prefer experimentation in the orthodox pattern and look down their noses on a purely military test, a large group of additional products were spread out for exposure to the forthcoming blast of concentrated irradiation. There were vaccines, viruses, anti-sera, bacteriophages, hormones, vitamins, biological-warfare agents, seeds and insects. All these were of comparatively harmless varieties (to avoid infection of people coming aboard after the test), and this phase of the experiment promised a little worthwhile information, despite the careless way in which these materials were physically handled by crews boarding the ships after the test. With luck there could even be developed some super-bacteria through the survival of only the most hardy and through mutations caused by gamma-

BUT for an inexcusably poor bomb drop, ship destruction would have been at least three times as impressive as it was. Before the test the 58th Wing, a highly political group of flyers wracked by internecine strife, guaranteed to place the bomb within 200 ft of the Nevada. As shown below, the bomb actually exploded above a point 2000 ft from the Nevada, about 1000 ft in the air, in a comparatively isolated area of the ship array.

ray exposure. Those super-bacteria in turn could conceivably be used to produce more potent anti-toxins and serums.

And, of course there were those accumulations of ground forces and air-forces equipment of almost infinite variety, sizes, and shapes, distributed in and on the target ships and on Bikini atoll; test panels of many experimental paints; and the 10,000 or more instruments similarly distributed. Outside the danger zone were the ships carrying preserved specimens of all Bikini wild life, and 10,000 lb of refrigerated Bikini fish, not for eating, but for later comparative purposes against specimens of their bomb-blasted brothers, to determine effects of radioactivity on tissue and blood.

In its way a measure of humorous relief, the stewards on Bikini island were icing down beer and storing liquor and sporting equipment, and in general tidying up the entire camp, seemingly skeptical of possible gasification from the explosion only 3 miles away.

Such was the stage setting when, early on the morning of June 29, AAF weather experts on Bikini and Kwajalein, graphing their upper air soundings, moisture determinations and incipient weather zones, promised Admiral Blandy consistent easterly winds up to 60,000 ft for the next morning, along with sufficiently clear sky to permit a visual bomb drop and subsequent inspection and photography. This was no mean prophecy in itself in this region of fickle weather, sudden rain squalls and typical dense cloud cover which had been constant for the preceding fortnight. There is no doubting that the weather prediction was the single most critical variable in the entire test. Certainly no one was inclined to treat in a cavalier manner the radioactive cloud to be thrown up by the bomb, so steady wind movement from sea level to 60,000 ft was a prerequisite as protection against sudden lethal shifts in the wind to envelop the operational ships and aircraft which would be disposed to the windward.

With Atomic Day set for the next morning, the whole complex of movement and preparation got under way, centering at Bikini and ranging to a distance of 300 miles or more. No one component of the movement had much drama in itself, but the magnitude of the whole, on the charts at least, equalled a major amphibious landing. Timing brooked no delay in excess of 20 min, because of instrument settings.

In Bikini lagoon, it was unusual to see a ship in motion. But just a glance every hour or so gave an impression of more and more openness in the ship distribution. All day the 200-odd men on the target ships and atoll isles were busy each with his own assignment of setting a group of the 10,000 or so instruments, cameras, television cameras, radio transmitters, radioactivity monitoring devices, wave-motion calculators, etc., etc., each in its own peculiar way timed for brief intervals of operation before, during and after the bomb burst. The operational aircraft, some 65 in all, including drone, control and command ships, were given their final going over on the carrier *Shangri-La*, about 40 miles away, and on the airfields of Kwajalein, Eniwetok and Roi, all almost 200 miles distant. Particular attention was given to washing off all grease, oil and dirt, all of which have a tendency to absorb radiation. Just where all these ships and planes would be preceding the bomb burst and afterward could only be visualized from the complex operational plans and charts, as no one observer would see more than a ship or so limned against the horizon and a few half-identified aircraft, scattered as they would be over hundreds of square miles and stacked up to a height of 7 miles in the air.

At Kwajalein the strictest of security conditions were imposed as the experts spent all night in their air-conditioned building, assembling the components of man's most complex and lethal structure—the 4 tons of plutonium, heavy water, auto-catalytic cadmium rods, heavy firing mechanism to jump the sub-critical units of plutonium the few inches necessary to achieve critical explosive proximity, and the thick, heavy, non-metallic, mirror-ground shell or tamper which make up THE BOMB.

As late in the afternoon the *Appalachian*, on which this writer was a passenger, moved out of the lagoon, the surrounding array had already a deserted appearance. Practically all the target ships were flying a single flag, the red and yellow yoke indicating they were abandoned. Only several, including the *Nevada*, were still flying their ensign at the stern. The task force operational ships spent the night jockeying into their assigned places of operation. Admiral Blandy's flagship and several other craft were on the 12-mile circle from the *Nevada*, a few more (including the *Appalachian*) were on the 20-mile semicircle east of Bikini and the others were farther away.

The next morning broke bright and clear, with towering cumulous clouds at 1800 ft along the rim of the horizon. The Navy was obviously anxious to get the test over with and would have been inclined to push it through in spite of none-too-satisfactory weather. But, there was no denying that the weather experts had done themselves proud—it was the best day seen in these parts for several weeks.

At Kwajalein, all but the very essential personnel had been evacuated to the neighbor isle of Ebye during the night, as a precaution against a premature explosion during bomb assembly or in getting it air borne. Early in the morning those who remained picked a likely spot to crouch or manned the double line of water pumps flanking the runway, as General Ramey, plane commander, Maj. Woodrow (after Wilson) Swancutt, pilot, and Major Wood, bombardier, and the remainder of the crew walked to the B-29 "Dave's Dream" (named after a bombardier in Swancutt's crew who had been killed), which by this time had been dragged up a long earthen ramp to facilitate loading the A-bomb (complete with Rita Hayworth's luscious figure glued thereon—a spectacular victory for a press agent, a source of amusement to AAF General Kepner, an obvious irritant to Admiral Blandy), then backed off and otherwise made ready for take-off. This ramp paralleling the main runway at Kwajalein was a new and well guarded feature of the past month, and strange pilots coming into the field displayed a disconcerting tendency to attempt landing on it. At Tinian a pit was used to load the first two atomic bombs. Why either a pit or ramp is required, this writer does not know.

By 8:30 a.m., July 1, a Monday, Major Swancutt had lifted his plane to somewhere between 20,000 and 30,000 ft, following an intricate course laid out over deserted stretches of ocean, and was starting his first dry bombing run over the target. His progress was periodically reported over the loudspeakers throughout the task force, and some 40,000 men began to line the rails of ships and peer from the blisters of aircraft, all seeking to focus on that small point hazy on the distant horizon which was Bikini.

The only atomic detonation (the purists prefer deto-

nation to explosion) previously reported in detail had been the first, the bomb hung on a steel tower on the Alamogordo, N. M., Army reservation, near the Los Alamos laboratory. William Laurence, of the New York *Times*, had written that official newspaper release, and in the semi-darkness of early morning and at a distance of 20 miles he had reported, as only a highly imaginative newspaper man can, a searing flash blinding to the eye for minutes, a shock wave bowling observers over, a heat wave rushing by, and the typical mushroom smoke column lifting to the stratosphere in the matter of several seconds, shot through all the time with brilliant, spectacular multi-colored flashes of light. Of the many tales woven by Laurence, one was that at detonation, the temperature of the blast was 100,000°F, some 9000 times the intensity of the sun's surface.

Scientists likewise had emphasized precautionary measures. Therefore, the Navy issued high neutral-density goggles for observers, through which the sun appeared as a dull disk. Crewmen were instructed to face away from the explosion with arms shielding their eyes, and many failed to see much of the show. Even some scientists were the victims of overdrawn publicity. Karl Compton, in an airplane 24 miles away, wore glasses and covered his eyes. He missed entirely the best part of the show. To this writer, all this supercaution seemed difficult to swallow, and the personal decision was to look at the explosion with unprotected eyes, conditioned somewhat by preliminary glances toward the sun to stop-down the eyes' irises. Visibility was 12 miles, air temperature was 83°F, humidity was 84 pct, and air pressure was 29.875 in.

This writer stood on the open sky deck, 68 ft above water level. Bikini was not visible, even with the aid of the most powerful binoculars aboard. (Incidentally, a Navy copy of a very efficient Japanese design.) Nor was the bombing plane observable at any time. Everyone was quiet. Over the speakers came the announcement "bomb away." There was an inclination to start counting—1, 2, 3, 4—meaningless in itself as neither the exact height of the plane nor the free-fall characteristics of the bomb were known.

The bomb failed to live up to its advance billing as a visual spectacle. Certainly, this writer has no inclination to gild the horrific, so there is no denying a lack of terror aspects of the detonation from a sensory point of view. Well above the horizon (about 1000 ft above the ships), a few seconds before 9:00 a.m., came that garish unearthly pinprick of light, expanding almost instantly into the typical flaming, churning spheroid bubble about 1500 ft in diam, which in less than 30 sec disappeared into the rapidly rising creamy mushroom of turbulent smoke, supported by a ragged column or chimney of whitish smoke, all of which are so peculiarly characteristic of explosions arising from nuclear fission. Effect on the naked eye was in no way blinding, being of an intensity comparable to a lightning flash on a summer's day.

At the instant of detonation this observer was under the impression of hearing a faint puff (probably imaginative), although at the same instant the *Appalachian's* barograph rose 0.06 in. then dropped back to 0.01 in. above the pre-detonation reading. A more accurate micro-barograph rose 0.01 in. at detonation and stayed at that point. The barely perceptible combined sound and shock wave came 112.2 sec after detonation, indicating the bomb burst as being 20.38 miles distant. A heat wave was felt only by those with extra-sensory perception.

Meanwhile, the seething smoke column had been propelled up behind the cumulous clouds on the horizon and the top came in view some 7 min later at a height of 22,000 ft, the whole thing leaning then drifting southwestward. The stem of the mushroom had broken off and the target area was misty and indistinguishable from other areas along the horizon. Special photographers, from aircraft and ships nearer to the explosion succeeded, however, in getting spectacular color shots of the rising cloud column, the like of which was never duplicated in the three previous atomic explosions. And, interestingly enough, there was a newly perceived phenomenon of a large umbrella of condensed moisture (or ice crystals) formed above the top of the smoke colume at about 18,000 ft, which was overtaken by the cloud at 26,000 ft and melted. This ice cap was formed, likely enough, by the rarefaction following the pressure wave created by the rising column. It was easily visible to the unaided eye as far away as 40 miles, on the *Shangri-La*.

At 2½ min after detonation, the width of smoke and flame over the target was some 3800 ft; at 5 min, the width was 4400 ft; at 7 min, the smoke column was 22,000 ft high; at 8 min, the width over the target was 11,600 ft, and the smoke column was 23,000 ft high; at 9 min, the width was 12,000 ft, and the top of the smoke mushroom had lifted to 24,000 ft; some 15 min later the smoke reached an altitude of 35,000 ft, as determined by high-flying aircraft; and its maximum height before disintegration was close to 50,000 ft. Within 15 min the entire smoke column had drifted beyond this observer's vision, and aircraft lost visual contact with the cloud within 30 min after bomb detonation. Some 9 hr later, aircraft left Kwajalein to hunt for the radioactive cloud area with Geiger counters, but after 3 hr of searching were unable to locate it.

All through the early phases of the explosion, this observer took glances at a television screen nearby, receiving signals from transmitters located on Bikini and several nearby islands. The pictures, hazy, jerky and of poor definition—showed the flame and smoke enveloping the target ships, with the *Nagato* and *Nevada* in the center, steady in the water and showing no roll for 2 min, after which they were obscured from view. At all times the beach and several palm trees on Bikini were in the immediate foreground of the screen, and despite the wide unobstructed corridor between the *Nevada* and the beach, the fronds of the palm trees showed no discernible agitation, let alone any stripping from the trees. At no time did there seem to be any larger-than-usual waves rolling up on the beach. Before the television screen pretty well conked out 3 min after detonation, there were observable a secondary fire on a cruiser and a heavy smoke pouring from a destroyer, both on the outer periphery of the target area. It was 2 hr before drone boats could be directed into the lagoon for water samples, and during that time period information as to what had happened there was sketchy and conflicting. After the scientists fussed with their slide rules, Admiral Blandy issued a statement saying the efficiency of the explosion was slightly less than the Nagasaki explosion, but greater than the explosion at Alamogordo or Hiroshima. (Pronounced Hi-ro′ shi-mi by the Japs). General Kepner praised the bombardier for an excellent drop (but it was downright inexcusably bad, being at least 2000-ft off, probably the result of failure to make certain quick bomb-sight adjustments that are automatic second nature to a more practiced bomba-

dier) and instructed the crew to fly home and get a good sleep.

Radio transmission was expected to suffer from the rising radioactive cloud, through ionization of upper air strata, but, surprisingly, transmission seemed to improve. There was the possibility that such a concentrated blast of radioactivity could conceivably reach the 20 miles to the *Appalachian*. This observer had a piece of dental X-ray film clipped to his shirt. On developing, there was an imprint of the clip on the film, the density being only a trace, equivalent to a 0.1-sec exposure on a dental X-ray machine. (Ordinary dental X-ray exposures require 3 to 5 sec.) So, while exposure at 20 miles was detectable, the intensity of gamma-ray exposure was insignificant.

This being the first atomic explosion over water, with little combustible material in the target area, there were some visual variations in behavior, as compared with Alamogordo, Hiroshima and Nagasaki. The funnel or stem supporting the yellow mushrooming smoke was whitish, whereas in the three previous explosions it had been dark or black. The high moisture content of the atmosphere was turned into fog in the rarefaction zone following the outgoing shock wave, which tended to obscure the brilliance of the explosion. And, there were no multi-colored lights in the smoke column—only occasional pinkish streaks and shadings, probably arising from gasification of ferrous constituents of the bomb-firing mechanism. Any other nuances of the display could come only from motion pictures, all official and none for unofficial showing. Private cameras had been confiscated at Kwajalein, although several were in surreptitious operation none the less.

The immediate effect of the disappointing visual display, together with the undramatic recordings of the television screen, had a curious effect on newsmen on the *Appalachian*. Ever conscious of the perishable nature of that commodity called news, over 150,000 words were filed for transmission and a number of radio broadcasts were made during the 2-hr waiting period. To listen to some of the excitable radio descriptions originating on the *Appalachian* could only lead to the conclusion that those commentators had either seen a different detonation or had been in some far more advantageous spot. The news stories fell into two classifications, one group disillusioned and disparaging, the other group picturesque and colorful and interlarded with excitement and drama, all of which sprang primarily from rationalizing minds (and pre-written stories) rather than realistic eyes.

The whole temper of many eye-witness reports were to undergo drastic shifts within the next 24 hr.

That the newsmen went all out the first few hours, each to ride his particular extremism, was in itself a climactic escape from some 18 days of suppression. Here, at last, was a little something in which to sink the teeth. It had been mighty slim pickings for the 18 days en route, although in characteristic fashion many had manfully risen to the challenge.

True to the herding instinct of the military, the Navy found it most convenient to segregate the entire press group on one ship, safely out of contact with scientists and the military, who were in turn isolated on two accompanying ships. Contact between the three groups was confined to a few fleeting hours of planned entertainment and conviviality at Honolulu and Kwajalein. For the first week, almost 100,000 words (at an average of 9¢ per word) were radioed from the *Appalachian*, all of the Joe-Blow type (i.e., a crewman, preferably enlisted, giving his all for the atom, soon to return home to start a chicken farm. Good for a full column in the home town paper). One such yarn about one of the ship's officers made him practically unbearable in so far as brother officers were concerned. And, near the tag end of the first week, some newsmen were reduced to the narcissistic dead-end of Joe-Blowing each other. There was a nice little flurry of stories on a Doctor Schneiderov of Johns Hopkins University, who won his brief moment in the limelight through a prophecy that the bomb would split the ocean floor and no observer would return, and a prominent science editor shot out an exciting column on the technical mystery of a drinking penguin, a novelty toy someone had brought aboard. There was a burst of effort to work up something around the Russian representative (a Naval captain with crossed sickle and monkey wrench on his shoulder boards, and known familiarly as "monkey wrench"), but he had had his ability to express an opinion on even such an innocuous thing as the weather long ago erased. A brief invigorating break occurred at Honolulu, where the Chamber of Commerce shot the works on hula-hula, sightseeing, luau food and poi, as well as light-green Bikini specials. The latter had such explosive effect on the three Russians (monkey wrench and two scientists from an accompanying ship) as to raise doubt in many minds regarding the well-publicized Russian prowess with vodka. Honolulu hospitality had some blurry and discreet relationship with agitation for admittance to the Union as the 49th state, a matter to them of intense concern, and to them certain of achievement this fall. From Honolulu to Bikini came a gush of 400,000 additional words based on orientation lectures, complete with the inevitable mimeographed handouts based strictly on Smyth. (The year-old official Smyth report on atomic research from which all popular and learned books flow, usually without credit. There are no data on the atom bomb or the researches involved in atomic energy, other than what appears in Smyth.) There was a brief pick-up in interest when Yves Farge, the French newspaperman, (pretty lonesome through inability to speak English) was appointed French Minister of Food after an exchange of messages with Paris. Seemingly, before he came on the trip he authored an article saying black marketeering should be stopped so he was picked up by seaplane and flown back to France to see whether he could do it. His confidence of success was such as only a newsman can conjure.

By the time the press hit beautiful Bikini beach, complete with Navy orchestra and foamy beer under the rustling palms, it had drunk to the full on mimeographed handouts, fleeting rubs of the shoulders with star-studded brass, as well as the usual ministrations of press agents and the stylized hypnotism of press conferences, which over the past decade have wrung practically all individual aggressiveness from the profession. At Bikini many newsmen were burning their bridges—they were sending out conjectural stories on what the atom bomb would do to the target array. Soon they would see the actual results, each to interpret into a preconceived pattern of judgment.

What were the results? By mid-afternoon the eight yellow-drone boats were in and out of the lagoon with their water samples. The drone aircraft had passed without incident through the radioactive cloud to secure filter samples, although one of the four Navy drones fell out of control into the sea prior to its run, and another escaped and had to be chased by the

mother plane for 55 miles before recapture. These planes had no special ignition protection and experienced no ignition failure while in the intensely radioactive cloud. On landing at Roi, they were so hot radioactively that two could not be approached for 8 hr and the third was still a threat to personnel 40 hr after passing through the cloud.

Radiological monitoring teams had worked into the lagoon shortly after mid-day, followed by salvage craft which started to play water on some ships. By late afternoon the *Appalachian* was anchored well within the lagoon (with fresh water distillation equipment secured) about 4 miles from the *Nevada,* which through binoculars seemed little damaged. Two transports and one destroyer (*Anderson*) couldn't be located and were presumed to be sunk. Another destroyer (*Lamsen*) was capsized and appeared to be slowly sinking. The *Sakawa* was a shambles topside with even the heavy armored gun turrets crumpled, and her stern was split open at sea level; she was taking in water badly and just about 24 hr later slid to the bottom, without anyone getting aboard. (The only *Sakawa* survivor was one pig found swimming in the water.) The superstructures of the *Pensacola, Nagato* and *Arkansas* were seared and twisted with large sections blown completely away or flattened. The carrier *Independence* was the most dramatic sight of all; her whole flight deck was buckled and twisted and the hangar deck underneath blown completely open. All night seething secondary fires ranged the complete length of the *Independence,* but next morning these had died out, and the hull appeared tight and the ship showed no list. On other ships occasional fires of secondary origin broke out, smoked a little and then died away.

By next morning the entire scene was tranquil and radiological parties were moving about, boarding ships for inspection. By noon (27 hr after the blast) most of the ships were flying a white and blue able flag indicating their safety from a radiological standpoint, and by late afternoon many of the ships had their X-ray flag (blue cross on white field) flapping in the breeze, indicating that their crews were back aboard.

The afternoon was spent in close examination of the ships from a small craft. The lagoon water was heavy and iridescent with fuel oil, and at no time were any dead fish seen.

An appraisal of the damage wrought in the lagoon by the atomic bomb must necessarily be a combination of self-evident evidence tempered with judgment. Naturally one observer, such as the writer, is in no position to appraise confidential information and present a considered and accurate decision. That will be the job of the President's Evaluation Committee (Karl Compton, Bradley Dewey, Fred Searles, and some illustrious Senators) who within a few weeks should have an unclassified layman's report for public release, based on information weaned from the various instrumentations and inspections by experts. The complete, accurate, top-secret analysis, which ultimately will be translated into terms of U. S. sea power, probably won't be unravelled for more than a year. That analysis will be the work of the Joint Chiefs of Staff Evaluation Committee (i.e. Karl Compton, Bradley Dewey, interspersed with bewildered brass such as Uncle Joe Stilwell).

But, unlike Baron Munchausen's Charlie, dis writer vas dere, and his observations and conclusions are as follows:

THE unexpected phenomenon: Note the umbrella of vapor or ice crystals above the rising smoke column. The rapidly rising mushroom forced ahead of it an atmosphere pressure wave, followed by a rarefaction zone in which appeared this layer of vapor or ice at about 18,000 ft. At about 26,000 ft the rising smoke caught up with, enveloped and destroyed the ice cap.

(1) The bomb drop was miserably wide of its mark —a good 2000 ft. The 58th wing of the 509th is the outfit which has dropped all three atomic bombs, and it is quite a tangle of fighting for personal publicity and position. There's good reason to believe that the crew dropping the Bikini bomb was not the best of the three contesting for the honor. In any case a Major has been in administrative and training duties so long as to be pretty rusty on the innumerable last-minute bomb-sight adjustments required for the 500-ft precision usually achieved even under combat conditions. A Warrant Officer bombardier would have been a better bet. Two days after the drop, Swancutt and Wood were obviously chastened, and their attitude toward each other was grim and strained.

(2) The general impression given by the air forces is that the bomb detonated at some 200 ft above sea level. From evidence on the *Pensacola* as to direction of the blast, this writer is convinced that the detonation occurred at much higher level, very near 1000 ft above sea level.

(3) The bomb burst was less than expected, say equivalent to 15,000 tons of TNT. But the efficiency could just as well have been near the theoretical maximum of 50,000 tons of TNT, in which case the goggles

[CONTINUED ON PAGE 73]

ACCIDENT control and quality control are on the same management level at Northrop Aircraft.

Statistical

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By J. M. HOWELL and LEE JOHNSON

Quality Control Engineer and Safety Engineer, respectively, Northrop Aircraft, Inc. Hawthorne, Calif.

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Use of a statistical approach for the control of accidents in much the same manner that such a procedure is employed to control product quality is described herein. Preliminary studies of this new approach indicate that it will aid materially in reducing accident rates.

STATISTICAL methods have been used to control the quality of manufactured products for several years. Such characteristics as dimensions, weight, hardness and others have been controlled by the use of charts. The control chart technique has also been successfully applied to many problems other than manufacturing. One of the most interesting of these has been the application to the control of accidents and, from preliminary study, it appears that this application will aid materially in reducing accidents.

In order to show what has been done in this application, it will be necessary to point out some simple aspects of statistical theory. It has been found that when measurements are made on the heights of men, length of leaves on a tree, or dimension of a part many of the measurements fall near the average of all the measurements, while toward the extremes of the distribution are relatively few measurements, as indicated in fig. 1A. In fact, it is found that in many cases, these measurements will be very near a certain mathematical curve which is called the normal curve. The normal curve has a mathematical formula which may be expressed in terms of two constants, the average and the standard deviation. When these two constants are known, the curve may be drawn as shown in fig. 1B.

If the measurements are expressed in terms of the standard deviation (σ) units from the average, it is possible to determine the approximate percentage of measurements lying within given distances or limits:

Limits	Pct of measurements
$a \pm 2\sigma$	95.5
$a \pm 3\sigma$	99.7

Several statistical distributions approach the normal distributions and the theory of the normal distribution is used to determine limits for most control charts.

The unit used in control of accidents is the number of injuries reported per 1000 man-hr worked. The number of reported injuries include the total count of all first aid, medical (cases seen by doctor) and lost time injury cases. Lost time injury cases mean that

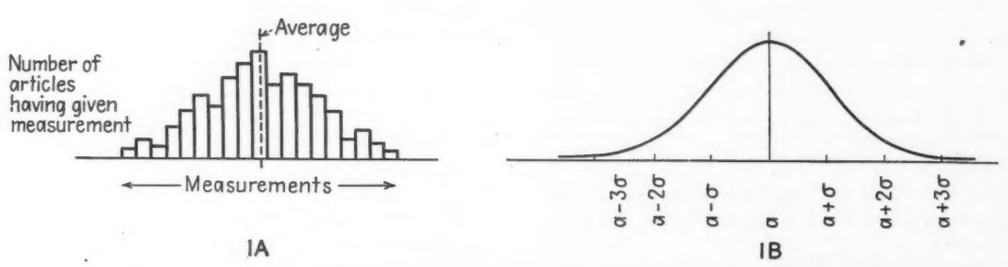

FIG. 1—Illustrating two aspects of statistical theory which are being applied to accident control.

Control of Accidents . . .

the severity of the injury has caused the injured employee to miss more than one day of work. For example if in a given department there were eight accidents for one week, and 4000 hr worked in that department for the period, then the rate would be 2.0 accidents per 1000 man-hr. The next week the rate might be 2.5 injuries per 1000 man-hr. After several weeks have elapsed, an average is determined. On charts that are placed in the shop the average or central line as it is called is placed at $\bar{c}$. The limits are:

$$\bar{c} \pm 2\sqrt{\frac{\bar{c}}{\bar{n}}}$$

where $\bar{n}$ is the average number of units for the period on which the average is calculated. In the case of accident charts, the units are injuries per 1000 man-hr and the average number of units is the average number of 1000 man-hr.

An example of a chart of this type which is posted in the shop is shown in fig. 2. Since this chart is in plain sight, supervisors and the workers can see at any time what the safety record is, and can see any significant changes. Specific instructions are given employees to

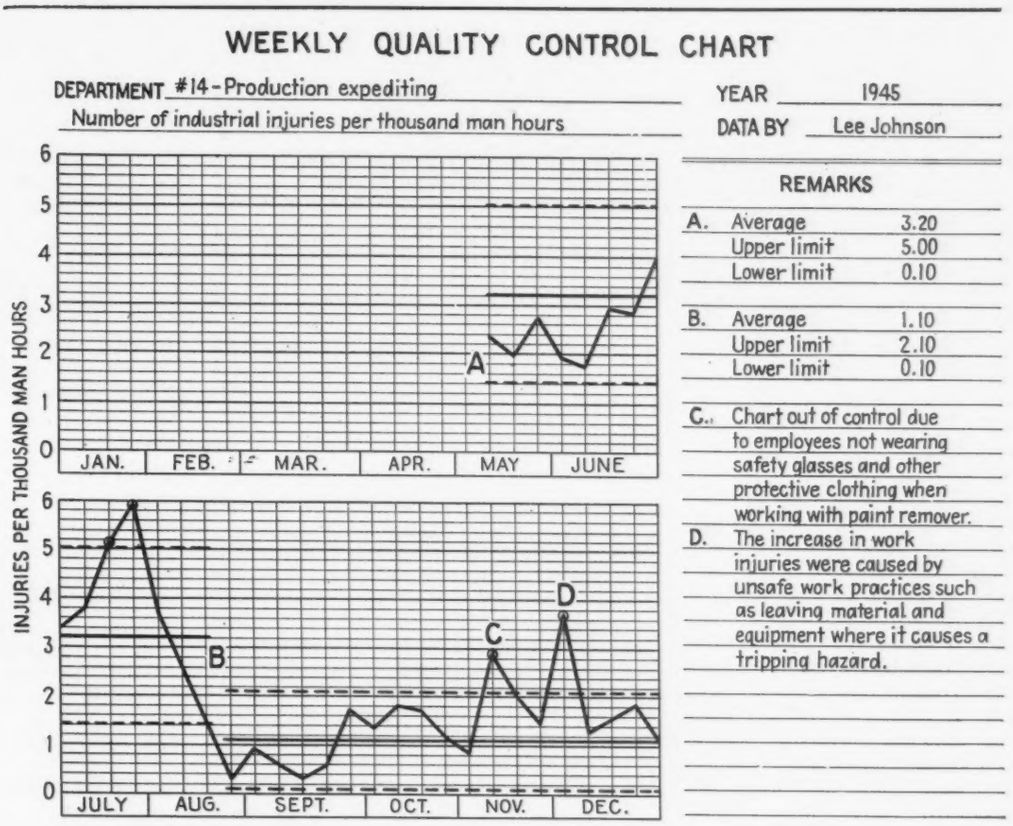

FIG. 2—Weekly chart showing injuries posted in the shop on a bulletin board.

ACCIDENT CONTROL CHARTS

● This chart shows the number of industrial injuries (including first aid, doctor and lost time cases) in this department for each 1000 man-hr worked and is posted to give production personnel a weekly record of the accident prevention work.

Explanation of the Chart

● The center solid line on the chart shows the average number of injuries per thousand manhours worked, based on past performance of the department. The upper (UL) and lower (LL) lines are limits set to maintain this average and show changes in operation conditions.

● A point is placed on the chart weekly to show the accident prevention performance in this department. If this point is within the limit lines it indicates that there has been no significant change in operation conditions. Difference between points inside the control limits are normal, and do not signify a change in operating conditions.

● A point above or below the limit lines indicates that conditions have changed. This is not a reflection against the department—investigation will determine the cause of the change. A point above the control limit indicates an increase in trouble such as an increase of physical work hazards or the inattention of the individuals to work safely, or it could be a combination of both causes, while a point below the control limit indicates improved safe working conditions and improved safety attitude of individuals.

Use of the Chart

● When a point is within the control limits, no action will be taken. When a point is outside the control limits, the safety engineer will investigate to determine the cause of the trouble. Production is expected to cooperate in determining these causes, and take corrective action within their jurisdiction.

Improvement of Preventing Accidents

● When the average number of industrial injuries is out of line with good safety practices, production personnel will be expected to aid in the reduction of unsafe work practices in that department. Improvement will be shown by a general reduction in the average value over a period of time.

Data and computation sheet
ACCIDENT CONTROL

PLANT: Main — DIVISION: Assembly

Dept. 14 — 1945

Week End	TMH. n	INJ.	INJ/TMH c	Ave. $\bar{c}$	Diff. $c-\bar{c}$	$\sqrt{\bar{c}}$	$\sigma=\frac{\sqrt{\bar{c}}}{\sqrt{n}}$	$t=\frac{c-\bar{c}}{\sigma}$	Week End
5-12	4.15	10	2.41	3.20	−0.79	1.80	0.89	−1.0	5-12
5-19	4.10	8	1.19		− 1.25		0.89	− 1.5	5-19
5-26	4.10	11	2.68		− 0.52		0.89	− 0.6	5-26
May	**12.35**	**29**	**2.58**						
6-2	4.10	8	1.95		− 1.25		0.89	− 1.5	6-2
6-9	4.05	7	1.73		− 1.47		0.90	− 1.7	6-9
6-16	4.05	12	2.96		− 0.24		0.90	− 0.3	6-16
6-23	4.26	12	2.82		− 0.38		0.87	− 0.5	6-23
6-30	4.47	18	4.02		− 0.82		0.85	0.9	6-30
June	**20.93**	**57**	**2.73**						
7-7	4.68	16	3.42		0.22		0.84	0.2	7-7
7-14	4.79	18	3.77		0.57		0.82	0.6	7-14
7-21	5.10	26	5.10		1.90		0.80	2.3	7-21
7-28	4.85	29	5.98		2.78		0.82	3.4	7-28
July	**19.42**	**89**	**4.60**						
8-4	4.85	18	3.71		0.51		0.82	0.6	8-4
8-11	4.90	13	2.66		− 0.54		0.82	−0.7	8-11
8-18	1.96	3	1.52		− 1.68		1.29	− 1.3	8-18
8-25	3.26	1	0.31		− 0.79		0.57	− 1.3	8-25
Aug.	**14.97**	**35**	**2.34**						
9-1	5.16	5	0.97		− 0.13		0.46	−0.2	9-1
9-8	7.16	4	0.56		− 0.54		0.39	− 1.3	9-8
9-15	9.16	3	0.33		− 0.77		0.34	− 2.2	9-15
9-22	11.12	7	0.63		− 0.47		0.31	− 1.4	9-22
9-29	5.24	9	1.72		0.65		0.45	1.4	9-29
Sept.	**37.84**	**28**	**0.74**						
10-6	5.12	7	1.37		0.30		0.46	0.7	10-6
10-13	6.00	11	1.83		0.76		0.42	1.8	10-13
10-20	5.84	10	1.72		0.65		0.43	1.5	10-20
10-27	8.00	9	1.12		0.05		0.37	0.1	10-27
Oct.	**24.96**	**37**	**1.48**						
11-3	8.52	7	0.82		−0.25		0.35	−0.7	11-3
11-10	3.72	11	2.96		1.89		0.54	3.5	11-10
11-17	4.24	9	2.12		1.05		0.50	2.1	11-17
11-24	4.10	6	1.46		0.39		0.51	0.8	11-24
Nov.	**20.58**	**33**	**1.61**						
12-1	5.16	19	3.68		2.61		0.46	5.7	12-1
12-8	5.44	7	1.29		0.22		0.44	0.5	12-8
12-15	5.32	8	1.50		0.43		0.44	1.0	12-15
12-22	6.48	12	1.85		0.78		0.41	1.9	12-22
12-29	4.00	4	1.00		−0.07		0.51	−0.1	12-29
Dec.	**26.40**	**50**	**1.89**						

NOTE: First average (3.20) based on period May 7 to Aug. 18 incl.
Second average (1.10) based on period Aug. 21 to Nov. 10 incl.

ABOVE

FIG. 3—Data and computations used in establishing the curves shown in fig. 2.

report all injuries, no matter how slight, to the plant hospital. An example of the instruction and explanation sheet which is posted with each shop chart is shown below the chart, fig. 2. Fig. 3 shows data and computations for chart shown in fig. 2. The charts were first posted in the shop in November. Data prior to that time were analyzed and plotted, but no corrective action was taken on this past data. The limits used in these calculations may be revised at any time that the conditions of operation or the number of men working in a department change considerably.

One might think that there would be a tendency for employees not to report injuries in order to make their chart appear better. This has not been the case, for during the period November to February, the total number of injuries have been rather stable, but lost time injuries have been reduced by approximately 50 pct and medical cases have been reduced by approximately 35 pct.

A form similar to that shown in fig. 4 is also sent each week to all supervisors so they can see relations between departments and also the effect of their department on the division, and the effect of the divisions on the whole plant. The chart shows the breakdown of the plant into divisions; and the divisions into departments where charts are maintained.

A series of charts called management charts are made up monthly and distributed to management and supervision. These charts show the number of accidents and rates by division and department. In order to show all departments with varying rates on the

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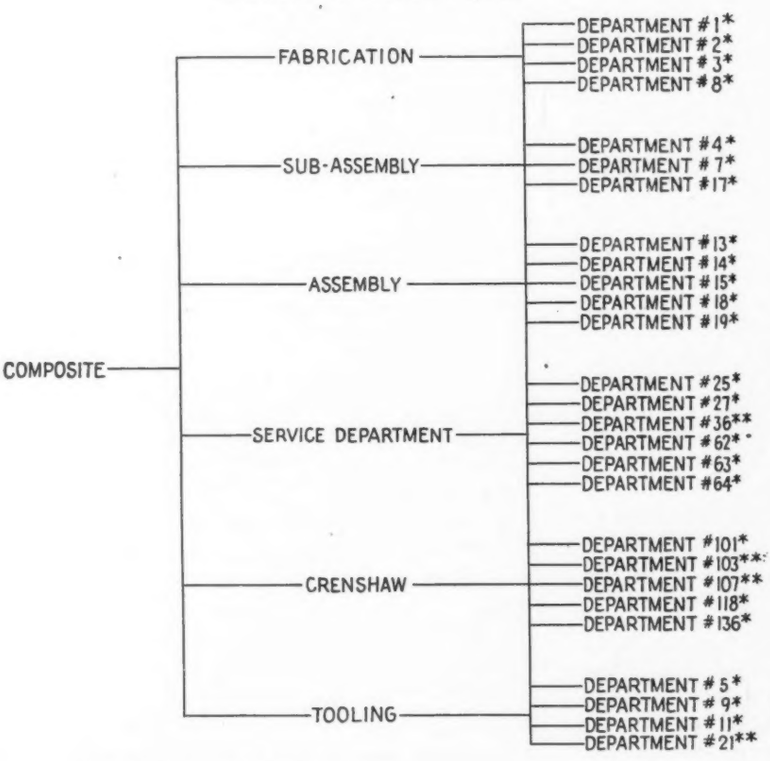
BELOW

FIG. 4—Form sent weekly to supervisors indicates relations between department with respect to accident rates. Injuries above normal which require corrective rates should be noted in color to attract attention.

SUMMARY OF SAFETY CHARTS
WEEK ENDING FEBRUARY 9, 1946



*-Indicates normal injuries
**-Indicates injuries above normal and requires corrective action
***-Indicates injuries below normal

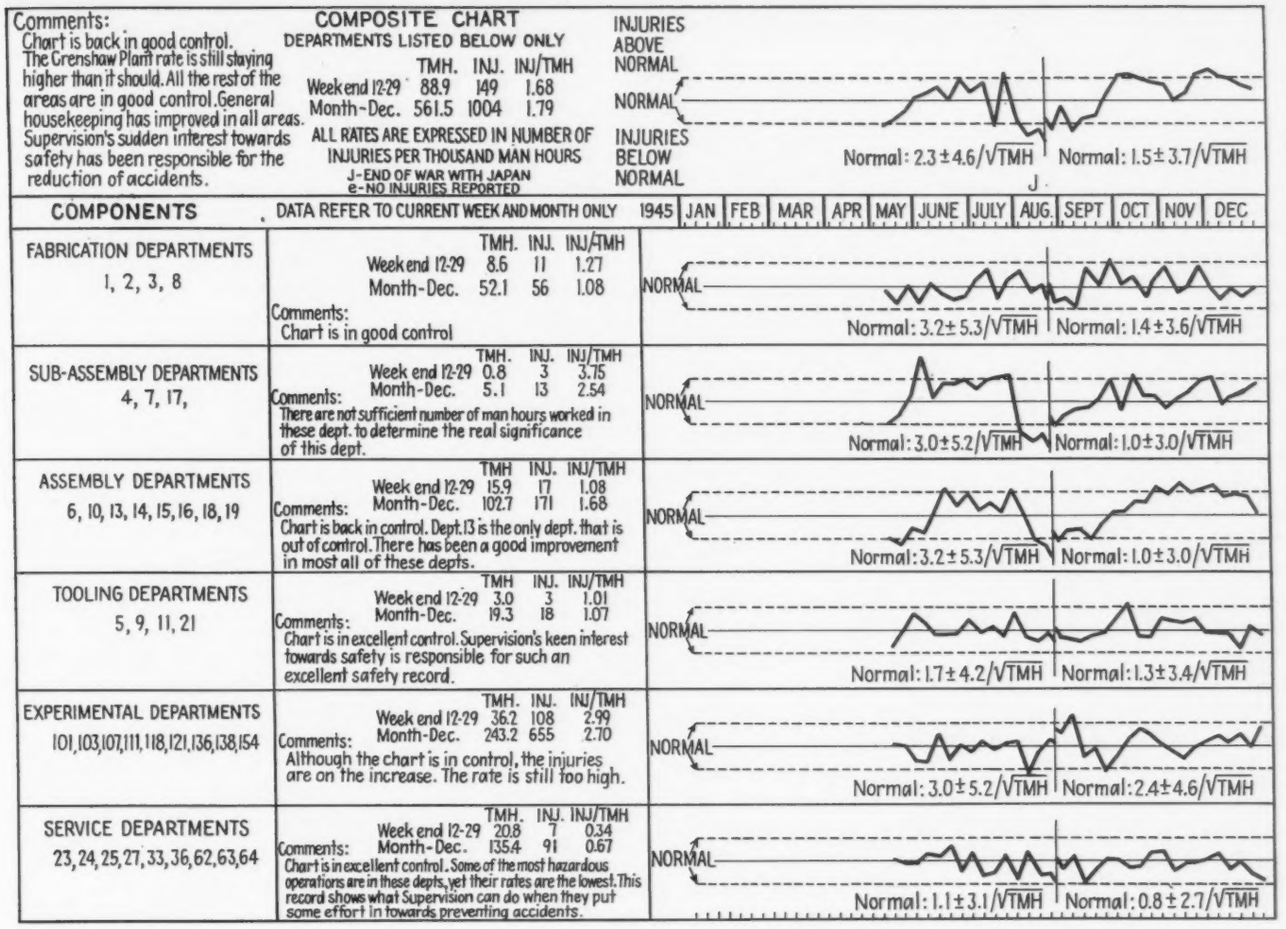

Comments:
Chart is back in good control. The Grenshaw Plant rate is still staying higher than it should. All the rest of the areas are in good control. General housekeeping has improved in all areas. Supervision's sudden interest towards safety has been responsible for the reduction of accidents.
COMPOSITE CHART
DEPARTMENTS LISTED BELOW ONLY
TMH. INJ. INJ/TMH
Week end 12-29 88.9 149 1.68
Month-Dec. 561.5 1004 1.79
ALL RATES ARE EXPRESSED IN NUMBER OF INJURIES PER THOUSAND MAN HOURS
J-END OF WAR WITH JAPAN
e-NO INJURIES REPORTED
INJURIES ABOVE NORMAL
NORMAL
INJURIES BELOW NORMAL
Normal: 2.3±4.6/√TMH
Normal: 1.5±3.7/√TMH
J
COMPONENTS
DATA REFER TO CURRENT WEEK AND MONTH ONLY
1945 JAN FEB MAR APR MAY JUNE JULY AUG. SEPT OCT NOV DEC
FABRICATION DEPARTMENTS
1, 2, 3, 8
TMH. INJ. INJ/TMH
Week end 12-29 8.6 11 1.27
Month-Dec. 52.1 56 1.08
Comments:
Chart is in good control
Normal: 3.2±5.3/√TMH
Normal: 1.4±3.6/√TMH
SUB-ASSEMBLY DEPARTMENTS
4, 7, 17,
TMH. INJ. INJ/TMH
Week end 12-29 0.8 3 3.15
Month-Dec. 5.1 13 2.54
Comments:
There are not sufficient number of man hours worked in these dept. to determine the real significance of this dept.
Normal: 3.0±5.2/√TMH
Normal: 1.0±3.0/√TMH
ASSEMBLY DEPARTMENTS
6, 10, 13, 14, 15, 16, 18, 19
TMH INJ. INJ/TMH
Week end 12-29 15.9 17 1.08
Month-Dec. 102.7 171 1.68
Comments:
Chart is back in control. Dept. 13 is the only dept. that is out of control. There has been a good improvement in most all of these depts.
Normal: 3.2±5.3/√TMH
Normal: 1.0±3.0/√TMH
TOOLING DEPARTMENTS
5, 9, 11, 21
TMH INJ. INJ/TMH
Week end 12-29 3.0 3 1.01
Month-Dec. 19.3 18 1.07
Comments:
Chart is in excellent control. Supervision's keen interest towards safety is responsible for such an excellent safety record.
Normal: 1.7±4.2/√TMH
Normal: 1.3±3.4/√TMH
EXPERIMENTAL DEPARTMENTS
101, 103, 107, 111, 118, 121, 136, 138, 154
TMH. INJ. INJ/TMH
Week end 12-29 36.2 108 2.99
Month-Dec. 243.2 655 2.70
Comments:
Although the chart is in control, the injuries are on the increase. The rate is still too high.
Normal: 3.0±5.2/√TMH
Normal: 2.4±4.6/√TMH
SERVICE DEPARTMENTS
23, 24, 25, 27, 33, 36, 62, 63, 64
TMH. INJ. INJ/TMH
Week end 12-29 20.8 7 0.34
Month-Dec. 135.4 91 0.67
Comments:
Chart is in excellent control. Some of the most hazardous operations are in these depts, yet their rates are the lowest. This record shows what Supervision can do when they put some effort in towards preventing accidents.
Normal: 1.1±3.1/√TMH
Normal: 0.8±2.7/√TMH

FIG. 5—Charts provided management to show trends in accident rates in various departments. Symbols TMH indicate 1000 man-hr; INJ.—injuries; INJ/TMH—injuries per 1000 man-hr.

same scale, the following absolute measure is used:

$$t = \frac{c - \bar{c}}{\sqrt{\frac{\bar{c}}{n}}}$$

where c is the rate for the given week, $\bar{c}$ is the average rate over the base period and n is the number of 1000 man-hr for the given week. The values plotted on the management charts are then "t" values with the center line at O, the lower limit at—3, and the upper limit at 3. By this means, departments with different rates may be compared and all departments may be shown on the same type of scale. In addition to the data shown on the management charts, appropriate comments are also shown, to explain any irregularities and to point to correction of undesirable conditions. In general, these comments should be short and specific Self-explanatory items should be used very seldom, and then only for emphasis. Examples of these management charts are given in fig. 5.

It will be noticed that the normal ratings were changed in almost all divisions and departments after VJ day. This was done because conditions changed appreciably. After VJ day, there were fewer inexperienced and female employees than before. The relaxation of war time pressure on employees and supervision has allowed them to pay more attention to safety. The normal level in one department was also changed during November since the number of employees was changed about five-fold, and conditions were appreciably changed.

Some of the advantages of the use of quality control techniques as here applied to control of accidents are as follows: (1) Management, supervision and workers are aware of their accident rate and strive to lower it. (2) variations of such nature as to be significant are quickly noticed and corrective action may be taken, and (3) minor variations which are not significant may be safely disregarded.

This article is adapted from a paper presented at a meeting of the Southern California Industrial Safety Society.

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Problems In High Frequency Induction Heating

The increasing use of high frequency induction heating for localized hardening, brazing and soldering necessitates a wider knowledge on the part of designers as to the proper method of calculating size of induction coils. Simplified formulas for performing these calculations and general information on induction heating are presented herein.

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By E. H. Hulse,
Westinghouse Electric Corp., Los Angeles

o o o

INDUCTION heating is coming into increasingly wider use as a result of recent developments in equipment, but there are certain problems dealing with the design of the coils that can be solved only by the use of the proper formulas. Properly to understand these, it is desirable to have some knowledge of the fundamental principles upon which induction heating operates.

When an alternating current flows in any conductor, an alternating magnetic field is set up in the surrounding region. If the conductor is wound in the form of a solenoid, the greatest field strength is found inside the solenoid or coil. If then, a piece of conducting material is placed inside the field, a current is set up in this material. This current circulates around the outer periphery of the charge and thus causes heat to be generated, primarily in a surface layer of the charge that is within the coil. The thickness of this heated surface layer is dependent upon the depth of current penetration and the time that the current is allowed to flow. The greater part of the current flow is near the surface of the conducting material since the magnitude of the changing magnetic field decreases with the distance from the surface. Thus, more current is induced in the surface layers.

If the frequency of the alternating current flowing through the copper induction coil is increased, then the induced currents will tend to flow more and more in the surface layer of the charge. The depth of current penetration commonly used is that depth where the relative heating with respect to the surface heating becomes 13 pct of the surface heating effect. The depth of penetration in inches is given by the equation:

$$\delta = 1.98\sqrt{\frac{\rho}{\mu F}}$$

where ρ = Electrical resistivity in ohm-centimeters, F = Frequency in cycles per sec, and μ = Magnetic permeability.

From the above equation it can be seen that with other things being equal, high resistance materials undergo a greater current penetration than materials such as copper; the current penetration in a magnetic material is much less than in a nonmagnetic material; the current penetration in the 450 kc range is much less than the current penetration when low frequency equipment is used.

Various methods of mathematical analysis have been used in attempts to evaluate ways of calculating the heating effect produced when a metallic charge is placed in an induction coil. This article deals only with the application of high frequency power in the range of 450 kc to induction heating, and therefore the depth of penetration is very small. The generalized mathematical analysis of the problem of induction heating cylinders and slabs becomes rather complex. However, when the depth of penetration is less than one-fifth the diameter of a cylinder, or less than a third of the thickness of a slab, the generalized equations reduce to comparatively simple formulas.

The amount of power required to heat a given object to a given temperature in a specified time can be calculated by a comparatively simple thermal equation. The advantages of induction heating are not in any reduction of the power required, but rather in the ability to heat the object in a special way so that the rate of energy transfer, and therefore the rate of temperature rise in any given part of the material is

greater than can be developed by any other method of heating. The calculation of any problem in induction heating can be more readily followed if it is considered as being in three parts. The first of these parts consists of determining the thermal power that is required, the second consists of determining the magnetic flux required, and the third and last consists of determining the coil design that will give the required magnetic flux with the available current and still conform to the dimensions of the part to be heated.

The calculation of the amount of power required to produce the desired temperature rise in a material can be most easily expressed by the formula:

$$P = 17.6\ M\ C\ T$$

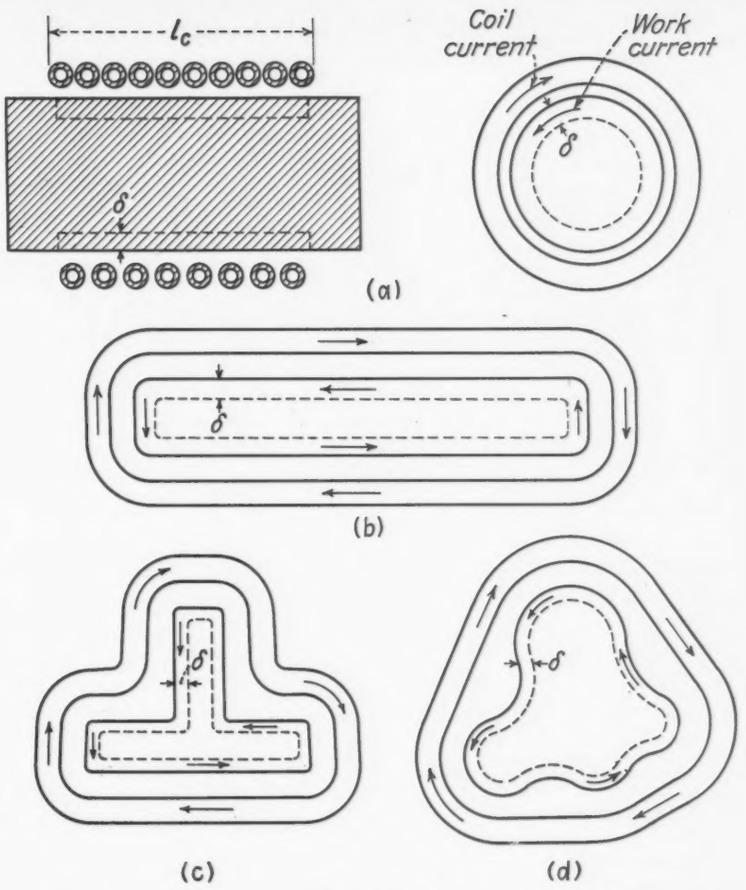
where P = watts required; M = desired heating rate in lb per min; C = specific heat of the material; T = desired temperature rise in degrees F. In addition to this, it will be necessary to consider the losses by both radiation and convection if the part is raised above 1000°F. Conduction losses are sometimes important if only a small section of a large object is heated. A calculation of these losses can be evaluated by standard formulas from mechanical engineering handbooks. The total thermal power in watts should be divided by the volume of the parts to be heated so as to obtain a figure of power density in watts per cu in. For this particular calculation, a hollow cylinder should be considered as though it were solid in volume.

The second portion of the calculation of an induction heating problem involves the calculation of the magnetizing force, and in the case of a magnetic cylinder this can be shown by the formula:

$$H_o = 100\left[\frac{P_v D}{0.275\sqrt{\rho F}}\right]^{\frac{2}{3}}$$

where H_o = the peak magnetizing force in oersteds; D = diameter of cylinder in in.; F = frequency in cycles per sec; ρ = resistivity of material in micro-ohm-centimeters cubed; P_v = required power density in watts per cu in.

Since most high frequency induction heating problems can be resolved down to the case of a cylinder or a flat slab, generalized formulas have been developed for determining the magnetizing force required for each of these cases,



TYPICAL examples of variously shaped parts heated by induced currents. Note that the depth of current penetration tends to remain uniform around the periphery of the material.

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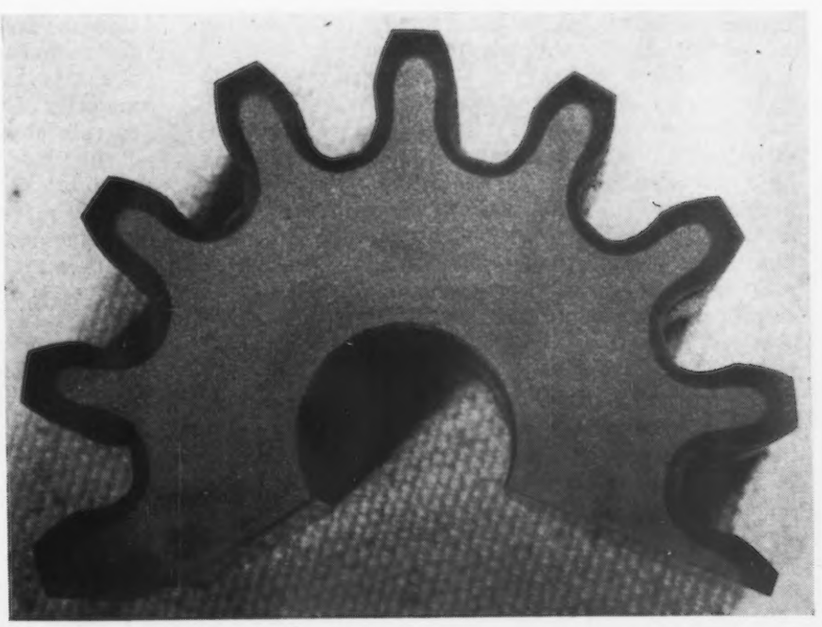
THE change in grain structure of gear teeth surface hardened by induction heating is clearly shown in this illustration.



and also for each case in either the magnetic or nonmagnetic condition. These are shown below:

Nonmagnetic cylinder

$$H_o = 1000\left[\frac{P_c D}{1.53\sqrt{\rho F}}\right]^{\frac{1}{2}}$$

Magnetic slab

$$H_o = 100\left[\frac{P_c t}{0.13 t\sqrt{\rho F}}\right]^{\frac{2}{3}}$$

where t = the slab thickness in inches.

Nonmagnetic slab

$$H_o = 1000\left[\frac{P_c t}{0.815\sqrt{\rho F}}\right]^{\frac{1}{2}}$$

The third and last consideration is the determination of the coil dimensions, current, and voltage required. This is partly a matter of cut and try with respect to the magnetizing force required. The actual coil length and diameter are determined by the dimensions of the piece to be heated, and some adjustment may have to be made after the initial calculation in case there are more turns required than can be fitted into the available length. The formula for determining coil turns is as follows:

$$N = \frac{H_o L}{0.7 I}$$

where N = turns of coil; L = length of coil in inches; I = current in amperes required from generator or available current from generator; and H_o = peak magnetizing force.

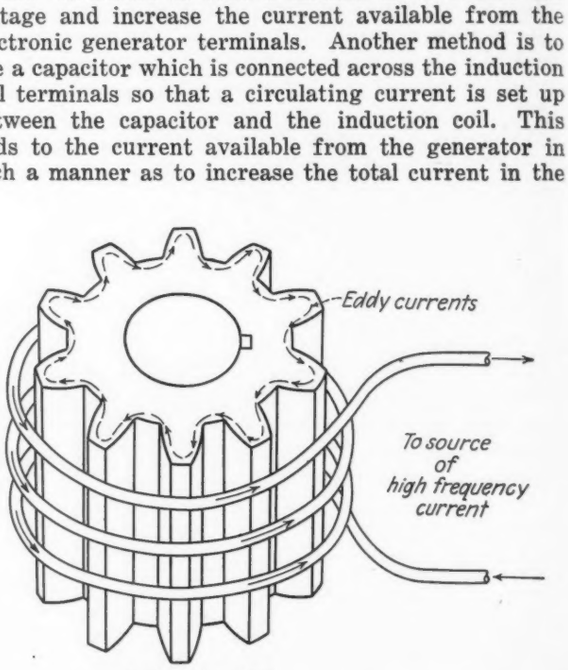
The coil voltage required in RMS volts can be obtained approximately by the formula:

$$E = H_o (2.86 \times 10^{-7} N A f K_2)$$

where N = number of turns; A = cross section area of coil in sq in.; f = frequency in cycles; and K_2 = a coil voltage factor depending on the ratio of the work diameter to the coil diameter, but for close spacing this can be estimated at 0.7.

It is a recognized fact that at a temperature of approximately 1350°F ferrous materials reach a temperature known as Curie temperature and become nonmagnetic. This means that if a ferrous metal is being heated by induction methods the characteristics of the material change abruptly at 1350°F; and unless sufficient magnetizing force is available, the material will not rise appreciably above that temperature. For conditions where a ferrous material is to be raised to a high temperature a most satisfactory solution of the problem will be to assume that it is nonmagnetic for purposes of calculation of magnetizing force and coil dimensions. The case of coils of special design, such as pancake coils and one-turn solenoids, cannot be readily calculated, and most satisfactory results are obtained if experimental work is done on the particular problem involved.

The preceding calculation formulas are reasonably accurate only for solenoid coils of several turns where the spacing between the coil and the charge is small. In many cases involving small coils, it will be found that with the current and voltage available from a standard electronic generator, it is not possible to wind enough turns, as well as turns per inch, on the coil to obtain the necessary magnetizing force. In this case, special means can be applied to increase the current available from the generator. One of the most popular of these methods is to use a current transformer connected in such a manner as to reduce the voltage and increase the current available from the electronic generator terminals. Another method is to use a capacitor which is connected across the induction coil terminals so that a circulating current is set up between the capacitor and the induction coil. This adds to the current available from the generator in such a manner as to increase the total current in the coil to a larger value than that obtainable from the generator alone. Particular means employed for connecting small coils, requiring large currents, to a given generator is dependent upon the manufacturer of the equipment involved.



THE path of the eddy currents in gear teeth may be followed easily in this illustration.

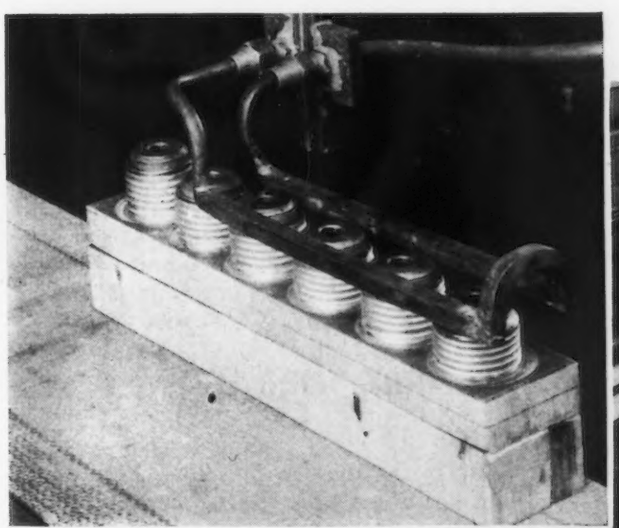
The use of high frequency energy for induction heating has risen to considerable importance in the past few years, primarily due to the availability of comparatively low priced electronic generators. One of the first large installations of electronic equipment for induction heating was the reflowing of the electrolytically plated tin coating upon sheet steel. This application has received considerable attention, and was the forerunner of the many installations for various other purposes that are to be found in industry today. The majority of the electronic generators for industrial use operate at a frequency of 450,000 cycles. This frequency has been found to give optimum results with a minimum of radio interference possibilities. The use of lower frequency equipment such as motor driven rotating generators is widespread, and many induction heating problems can be solved by either the lower frequency equipment or the electronic high frequency equipment. Low frequency equipment is most predominate where thorough heating of a piece is required although considerable surface hardening is done at low frequencies where the desired case depths are 0.1 in. or greater. However, high frequency equipment is more advantageous where shallow case depths less than 0.06 in. are required, or where heating of thin sections is involved.

The high frequency equipment has enjoyed wide usage in the field of case hardening. If a hardenable steel is used for the part, a satisfactory case depth can be obtained by rapid heating with high frequency in-

duction equipment and a subsequent quench. Very thin case hardening has been successfully accomplished by utilizing an extremely high-powered electronic generator and allowing the object to quench by rapid heat conduction into the charge. This is not usually economical due to the enormous amount of power required to heat a thin layer so quickly that conduction does not occur towards the center in any appreciable degree. Extremely high frequency induction equipment in the range of 5 million cycles has been employed to obtain very thin case depth for special applications. One of the advantages of induction hardening is the possibility of selective hardening without the necessity of copper plating and carburization. Selective induction hardening has been employed extensively for crankshaft bearings, piston pins, cam surfaces, and many other machine parts. There is very little distortion of the part, and only slight oxidation takes place, and that in the heated zone only. Thus in many cases the use of induction hardening makes it possible to machine the part, harden it, and then merely clean off the oxide without the necessity of machining the hardened area.

Heating for brazing is an ideal application for the use of induction heating. The ability to reduce scaling and oxidation, and the low distortion resulting from selective heating, has made induction brazing assume an important place in the overall brazing process group. It has been quite successfully applied to the low temperature soldering of various joints, and its use for silver brazing has become widespread, since the flow temperatures of silver alloy materials are below the Curie point of steel, and this allows extremely rapid heating in this region. Copper brazing can be accomplished quite successfully in nearly all cases by the use of induction heating equipment without the use of a controlled atmosphere. Since oxidation is a time-temperature function, the rapid heating with induction methods reduces the oxidation to a minimum, and limits it to the small area to be brazed.

Induction heating is a process that should be employed generally only on a production basis, since the initial cost is comparatively high, and the overall operating cost is also relatively high. The advantages are that it solves some problems that cannot be accomplished in any other manner, regardless of cost; it increases production when properly applied, and particularly when the part is designed with induction



ABOVE

CONTINUOUS soldering may be performed readily by utilizing a conveyor belt system.

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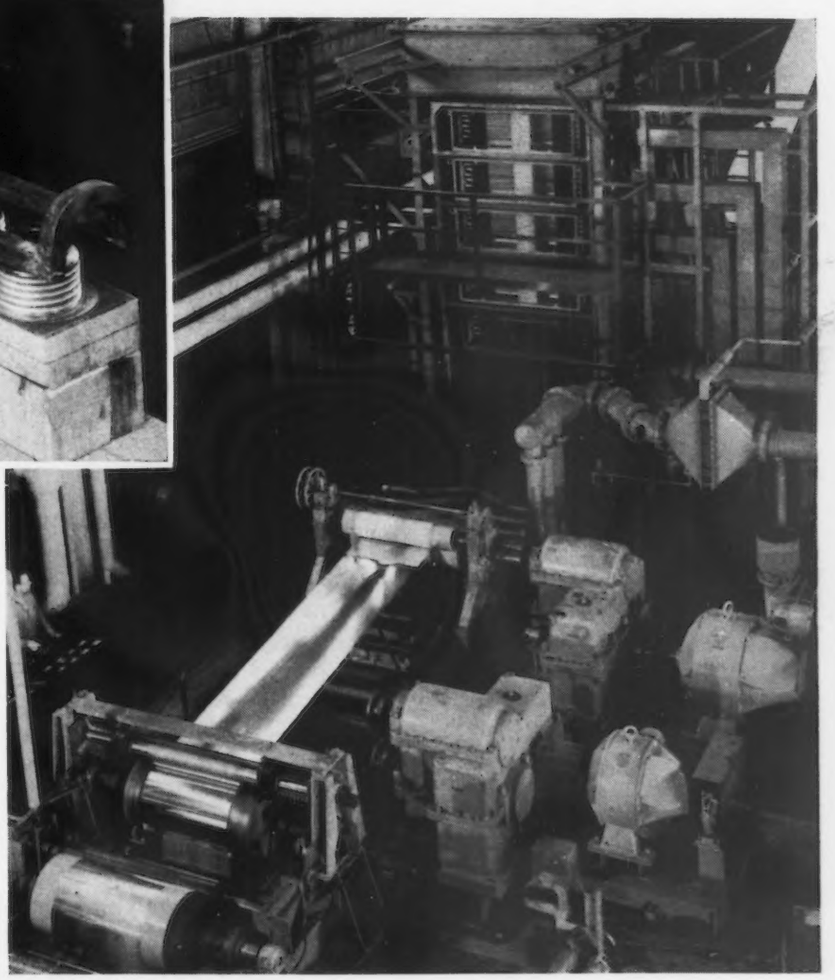
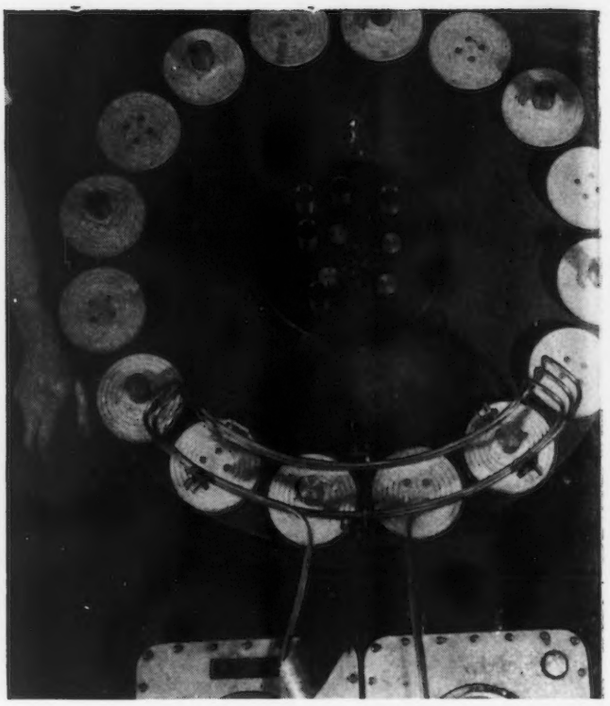
RIGHT

TINPLATE line showing plated strip passing vertically through the induction coils.



AUTOMATIC induction annealing of steel pins fed from a hopper.



CONTINUOUS automatic induction brazing by means of a rotating turntable.

heating processes in mind; the localized heating reduces oxidation, scaling, and distortion of the parts; and the equipment is flexible in application by means of different coils, jigs, and other devices.

The accompanying illustrations indicate the underlying principles of induction heating, and some practical applications of the process for soldering, brazing, annealing, and reflowing of tin plating.

Synthetic Spinel Used for German Bearings

A PROCESS for hardening synthetic spinel jewel bearings to the point where their performance approached that of synthetic sapphire bearings was developed by the Germans during the war, according to a report made by M. H. Barnes for the Joint Intelligence Objectives Agency.

Spinel, a crystalline mineral, is normally considered less satisfactory for bearings than sapphire because it is softer. For the same reason, it is easier to work and requires less diamond powder for cutting. This was an important consideration in Germany because of the severe diamond powder shortage.

The German hardening process involved heating the spinel to a temperature of 1740° to 1920°F for 12 hr. This precipitated the excess alumina in the spinel and converted it to a different alumina form, and as a result, the clear spinel turned cloudy and became harder. Final polishing of the bearing surface after heat treatment was done with diamond powder in the usual manner.

According to the German inventor of the process, spinel bearings would have been produced on a much wider scale in Germany had it not been for the opposition of the I. G. Farbenindustrie, which made sapphires.

Except for the spinel hardening process, no new applications for sapphire or spinel in the German industry were noted. Although German methods for making jewel bearings were closely guarded trade secrets before the war, investigation revealed that they depended on the basic Verneuil process.*

German jewel bearing firms used highly skilled, low paid labor. Production was considered an art, and little attempt was made to mechanize the industry. German jewel bearings were considered inferior to those made by French and Swiss gem cutters, according to the investigator.

** Sapphire and spinel are produced by Linde Air Products Co., utilizing the Verneuil process.*

TRAINING SPARK TESTERS

A program for the training of spark testers for the classification of seamless tubing is described in this article. This training program, equally suitable for the development of skilled testers for other steel products, teaches the apprentice to judge accurately to ±0.02 pct C in C1010 and C1025 steels. Sparking characteristics of carbon, silicon, sulfur, phosphorus, molybdenum, nickel and chromium are discussed in detail.

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THE manufacture of numerous sizes of seamless tubing from many grades of carbon and alloy steel necessitates very close control through the various production stages. The spark test is one of the important methods used in checking these different grades of steel.

In developing a spark test unit a well organized training program is followed. The manner in which a spark tester is trained to understand the fundamentals of the work and to acquire the proper technique is of particular interest. Spark testing, as it is explained to an apprentice, is a means for separating different grades of steel when the chemical analyses are known. This method is also fairly accurate in determining the steel grade of unknown samples.

The test is made by the use of a portable grinder with a carborundum wheel revolving approximately 15,000 rpm which, when applied to a sample of steel, throws off a pattern of sparks known as the spark stream. The spark stream is made up of numerous carrier lines which are the visible trajectories of the incandescent particles thrown off by the grinding wheel. These carrier lines transport the effects of the various elements throughout the spark stream. As a matter of simplification, to permit the apprentice to follow the description of the appearances of the various elements, the spark stream is divided into three equal parts; first, second and third segments, as shown in fig. 1.

The technique of classifying steel by spark testing is also discussed in the following articles published in THE IRON AGE: *"Classifying Steels by Spark Testing," Oct. 19, 1939, p. 38; "How to Identify Alloy Steel Scrap," Apr. 16, 1940, p. 39.*

Since spark testing is a skill that must be developed by the individual, practice with known standards is essential. For this practice a stationary grinder serves the purpose along with an assortment of standard steel specimens of known chemical composition. The apprentice is furnished with an AISI specification sheet descriptive of all the common grades of steel in the C1000 series. Since the common grades of steel are fundamental, each standard used is stamped with the exact chemical analysis as to percentage of carbon, manganese, phosphorus, sulfur and silicon.

The first standards presented are representative of the C1010 and C1020 classifications, the purpose being for comparison in order that the apprentice may note the difference in the spark stream due to carbon bursts. Fig. 2 illustrates the effect of carbon as its percentage increases. As the carbon increases this effect intensifies throughout the C1000 series. The apprentice will have difficulty in his first attempts to distinguish the difference in carbon content but with as little as 10 min practice can note the difference in carbon bursts. It is desirable in the early practice sessions to use standards in the low carbon bracket, 0.25 pct C and under, and to keep the remaining elements within a narrow range in order to prevent these elements from changing the appearance of the spark stream. Additional standards are then presented until the set, representative of C1010 to C1025 is completed. The apprentice will then practice until his skill in

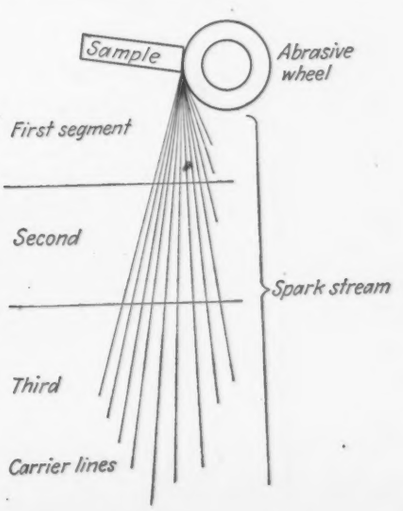

FIG. 1—For instructional purposes, the spark stream is divided into the three basic segments illustrated here.

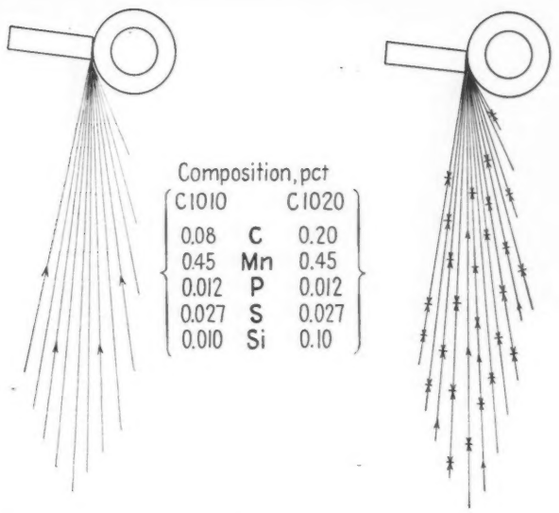

FIG. 2—Effect of increases in carbon content on the spark stream.

judging carbon content is accurate to ±0.02 pct in C1010 to C1025 classifications. After mastering the fundamental steel classification, specimens representative of C1025 to C1045 are presented. Since the preliminary practice is to develop ability to judge carbon content, the silicon content of this series is always under 0.10 pct. By using representative standards, properly identified as to steel classification, the apprentice can absorb the above training in approximately 16 hr of practice.

After the apprentice has completed the fundamental practice period, the effect of silicon is presented. Silicon can best be described as a killing agent which suppresses the carbon bursts and appears throughout the entire stream from the first to the third segment in the form of small beads of light, as shown in fig. 3. When described to an apprentice, 0.10 pct Si and under is termed low silicon and 0.15 pct and over, high silicon. Selection of standards is the same as in the practice period for carbon judgment. Standards are selected and compared in the same manner with the silicon appearing and intensifying as the percentage increases.

Since alloy steel seamless tubing is a specialty at the

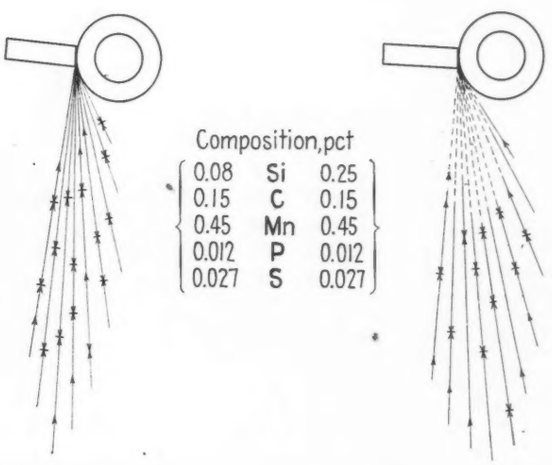

FIG. 3—Effect of increases in silicon content on the spark stream.

Gary Works, elements such as phosphorus and sulfur are not included in the training course. Grades having high percentages of these two elements are not used in the manufacture of seamless tubing. However, sulfur and phosphorus grades such as the bessemer types 1112 and X1112 can be readily identified by the spark test because of the high phosphorus and sulfur contents. As the sulfur content increases, a candle flame swelling appears throughout the entire spark stream. This swelling intensifies as the percentage of sulfur increases. Phosphorus appears in the third segment at the very end of the individual carrier lines in the form of a spearhead.

After the apprentice has absorbed the C1000 steel classifications, alloy steels of the NE8600 series are presented. The appearance of molybdenum in the

FIG. 4 — Spark characteristics of NE 8617 steel, illustrating effect of molybdenum on the spark stream. Chemical composition of this steel is: 0.18 C, 0.76 Mn, 0.01 P, 0.02 S, 0.21 Si, 0.54 Ni, 0.50 Cr, 0.20 Mo.

spark stream appears as a well defined spearhead at the very end of the stream. The difference between the phosphorus and the molybdenum spearheads is that the molybdenum spearhead is short and very distinct while the phosphorus spearhead is long and rather indistinct, as shown in fig. 4. Molybdenum not only appears as a well defined spearhead in the third segment, but also has a decided effect on the entire stream by suppressing the carbon bursts and by imparting an orange color to the entire spark stream. In testing grades such as NE8750, where the carbon content exceeds 0.45 pct, the distinct molybdenum spearhead will be covered up by the intense carbon bursts. When this condition prevails, molybdenum can be identified by the orange color appearing throughout the stream or by testing on the scaled surface of the steel which will show the molybdenum spearhead.

Nickel manifests itself as definite blocks of light along the carrier lines. The percentage of nickel in the AISI 2100, 2300, and 3100 series can be readily judged by the fullness of the rectangular blocks which appear larger and brighter throughout the first, second and third segments as the percentage of nickel increases. The appearance of nickel, when in combination with molybdenum, in the NE steel classification discloses another effect which appears in the shape of oblong swellings and possesses an orange color unlike straight carbon and nickel steels.

Chromium in steels has the effect of whitening the carrier lines and making them more distinct throughout the entire stream. This can be best illustrated by comparing 2.5 pct Cr, 0.5 pct Mo with 4 to 6 pct Cr,

0.5 pct Mo steels. The spark stream when compared will disclose the refining or whitening effect of the increased percentage of chromium.

After the apprentice has devoted sufficient time to the fundamentals of spark testing, standards representative of the many grades of alloy steel are presented for practice and classification.

The development of a competent spark tester necessitates conscientious practice and good instruction along with a variety of standards of known chemical composition. A spark test training program must be organized to such an extent that the apprentice can grasp the fundamentals as thoroughly as possible, for the development of an individual as a spark tester after the formal training is completed depends upon his trained ability for close observation and a questioning attitude when grades are encountered with which he is unfamiliar.

Using Coolants With Carbide Tools

CARBIDE tools generally function best when no coolant at all is used. On certain jobs, however, where it is necessary to maintain a high degree of dimensional accuracy, a coolant may be needed to prevent distortion of the workpiece. In such cases the use of a solution consisting of 1 part soluble oil to 30 or 40 parts of water is recommended. This variation in the proportion of water to oil is made necessary by the variations in the hardness of water in different parts of the country. The 30 or 40 to 1 mixture has proved to be an excellent coolant which also keeps the ways of the machine free from rust.

These recommendations were made by Fred W. Lucht, development engineer of Carboloy Co., Inc., in discussing a paper, "The Testing of Cutting Fluids" recently presented at the Cleveland meeting of ASTE by D. J. Wangelin. Lucht further advised that coolants, when used, should be supplied in large quantities, never in dribbles, and that the flow should be directed towards the cut underneath the tool, or from the side where the chip flow has the least tendency to interrupt the flow of the coolant. An intermittent flow of coolant, he pointed out, whether caused by inadequate flow, an umbrella action of the chip, or any other reason, always tends to reduce tool life.

Lucht also claimed that the soluble oil emulsion has given good results on all types of carbide machining operations except gun drilling. Here, experience has shown that the regular cutting fluids normally used for gun drilling give the longest drill life also with Carboloy drills.

Sheet Thickness Measured by Deflection

DEVELOPMENT of a new type instrument gage which is said to open a new aspect to the measurement of thickness of metal sheet stock has been announced by the Glenn L. Martin Co., Baltimore. The device may also be used for inspection of the bonds between the laminar layers of laminated materials.

Operating on the pressure principle, the gage consists of an inverted cupshaped shell with a top wall of transparent material and the bottom rim edged with a rubber gasket, as shown in the accompanying illustration. Mounted inside the shell is a dial indicator equipped with a stem reaching to a spherically shaped foot, which, when the instrument is being used, rests against the metal sheet surface.

A valve in the top of the case is connected to an exterior pump so that the air inside the gauge can be withdrawn or the pressure reduced to any desired or predetermined amount. The dial of the gage is of conventional design which measures thousandths of an inch as the foot is pushed upwards.

When in use the gage is placed on the area to be inspected, the valve is opened and the air inside the instrument allowed to reach normal atmospheric pressure. A reading is then taken which acts as a standard for the test. With the valve again closed, the air is evacuated and, should there be a faulty bond or no bond between the surface sheet and the adjacent layers, this loose sheet area will pull away from the other layers against the foot of the gage and the deflection will be detected on the dial.

Due to the instrument's ability to detect deflection in sheet materials, it also can be calibrated to inspect the thickness of a single sheet, particularly with large sheets where measuring central areas would be impossible with micrometers. In measuring thickness of sheet metal, the pressures recorded during the test are checked against predetermined gage readings for each thickness of the metal.

Use of the device is not restricted to metals and is equally efficient when testing wood, plastics, glass cloth, woven materials impregnated with plastics or any other which has sufficient structural strength to be used in laminated fabrics.

Tooling for Tapers . . .

Accurate production of tapers on the ends of screw machine parts can prove extremely difficult when close tolerances are required, unless the proper tooling procedure is followed. Careful analysis of the available tolerances as described herein, together with correct taper forming procedures, can, however, result in a minimum of 80 pct acceptable parts.

By JOHN J. MEADOWS
Consulting Engineer, New York

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IN THE course of experience in mass production it is common to encounter tapered surfaces on the ends of cylindrical parts such as shafts, and if these are not tackled properly they can cause no end of trouble. Where possible tapers should be cut so as to make the taper favor the required tolerances. This can usually be done by using a tool which approaches along the longer dimension of the taper. This advantage is seldom utilized under normal circumstances, with the result that excessive rejections materialize in the inspection department. Many examples of this situation were experienced in the past war which resulted in terrific losses in some items which soon became bottlenecks that seriously impeded the war effort.

If a taper has an included angle of less than 90° it is advantageous to cut the taper with an end tool, whereas an angle greater than 90° is favorable to a forming or side cutting tool. These relationships apply primarily where close tolerances are encountered such as in firing pins and like applications. The tendency in these applications has been to employ a forming tool or a taper cutting tool which is actuated by the cross-slide.

This usually results in loss in control over the critical dimensions of the finished product, particularly in such cases as those wherein the taper cut is used for cutoff purposes. In like manner, when a taper forming tool is used to point the leading end of a part, it usually results in loss of control over the finished dimensions, and in many cases can result in excessive rejections, because the normal tolerance allowances are used up in the first or second positions. This creates an impossible situation under which the subsequent operating positions must function. Under these circumstances it should not take a great deal of imagination to see why the rejections will be heavy. What makes it somewhat difficult to understand is the fact that there will always be a small percentage of parts that will pass inspection. This leads to the belief that the setup must be correct, or these acceptable parts would not be produced. Usually this would be rather difficult to explain if it were not for a mathematical explanation which is contained in that phase of mathematics which is known as *probability*. This is usually applied to operations and events which are subject to variations in conditions, such as games of chance, insurance, and similar matters, but can also

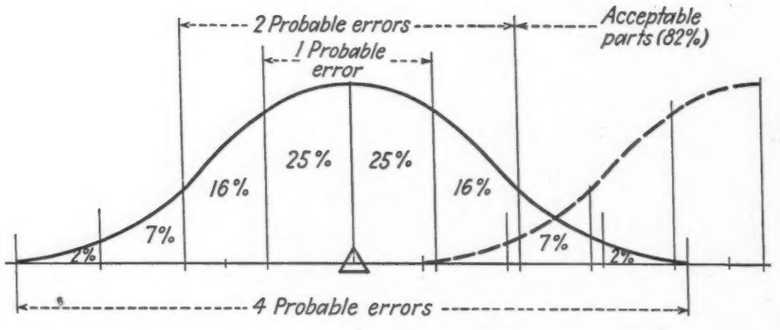

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FIG. 1—The curve indicating the probability of errors in artillery fire can serve equally well to show the probability of accurate machine production.

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be applied to production, and has been developed to a high degree in quality control. A particular application has been made in the military services where it has been employed in the control and improvement of artillery fire. This particular application can best be used in explaining its application to the condition outlined above.

In the manufacture of the powder that is used for propelling a projectile out of a gun, certain tolerances are permitted which affect the results obtained in firing. To these must be added certain variations which result from variations in the seating of the projectile in the gun, temperature of the powder, and deviations of temperature and other characteristics of the atmosphere from the assumed conditions. Most of the other deviations are corrected for in pointing the gun before firing. The deviations listed above are those which cannot be readily corrected for, and to determine their characteristics, proof tests are fired at the proving ground. These tests are fired under closely controlled conditions and could readily be classed as laboratory conditions. The results obtained are termed the probable error of that particular lot and projectile. It is usually expressed in terms of yards at a given range. Of course, it is realized that these laboratory conditions cannot be duplicated in the field so, based upon extensive experience, a range of four probable errors is allowed in analyzing the results of firing. After extensive analysis of results and application of probability formulas it was found that the results followed what is known as the probability curve shown in fig. 1.

Repeated experience has shown that the results of artillery fire, in the analysis of which the deviations have been reduced to percentages, have invariably followed the probability curve. The curve indicates that 50 pct of all shots will land within the limits of one probable error. Half of these will be over the center of impact and the other half short; 82 pct of all shots will land within the limits of two probable errors, 96 pct within the limits of three probable errors, and 100 pct within the limits of four probable errors. Allowing for some odd wild shots this will account for all results obtained. With this knowledge available the average artilleryman can determine exactly how many shots must be fired in order to completely cover a given area. This information is used in order to determine future requirements.

This description of the probability curve can be more closely applied to the laboratory conditions which are employed at the proving grounds, and it has been found that the results obtained have followed the same formula. A similar analysis can be applied to production wherein 80 pct is assumed to be the accepted goal. This will correspond approximately to the two-probable-error range indicated on the curve, and 20 pct of all production will be rejected. These rejections are represented by the portions of the curve beyond the central two probable errors. If production is being performed correctly it will bracket the control portion of the curve. If it is not being performed correctly the bracket will move toward or beyond either end of the curve. In the case wherein only 20 pct of the parts produced are passing inspection, it will be represented by a bracket that extends from a point corresponding to one probable error either side of center to a point correspondingly off the curve in the same direction. To better illustrate this condition a dotted curve has been superimposed on the basic curve so that only 20 pct of the parts produced come within the acceptable

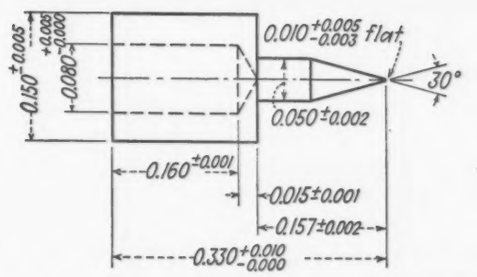


FIG. 2—In the production of this firing pin for the Mark 27 fuze, only 20 pct acceptable parts were obtained when standard tooling methods were used. New tooling and careful analysis of tolerances resulted in 80 pct acceptable parts.

range. The nearer perfection that the setup assumes, the greater will be the number of acceptable parts until production corresponds with the basic curve. This is the maximum efficiency that can be obtained.

The above analysis explains the circumstances which are sometimes hard to understand for the practical man who has not had a technical education. If these principles are understood, however, even the least educated will have gained a valuable piece of knowledge. Having gained this knowledge it might be well to analyze some practical applications. For this purpose the firing pin for the Mark 27 fuze and the striker for the Mark 31 fuze have been selected.

The firing pin for the Mark 27 fuze was a small aluminum part that was best produced by watch manufacturers because they had the necessary background of experience to be able to produce such small parts. However, with a little ingenuity it could have been produced as easily by any manufacturer who was equipped

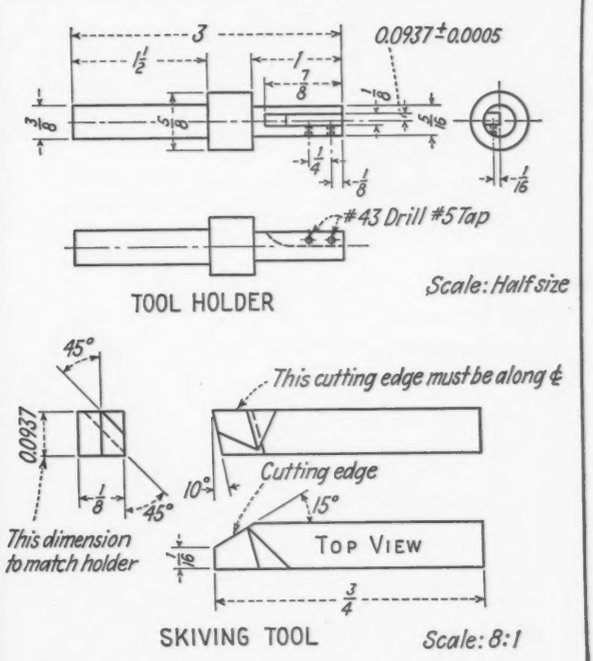


FIG. 3—Skiving tool and holder used in salvaging 50 pct of the previously rejected firing pins.

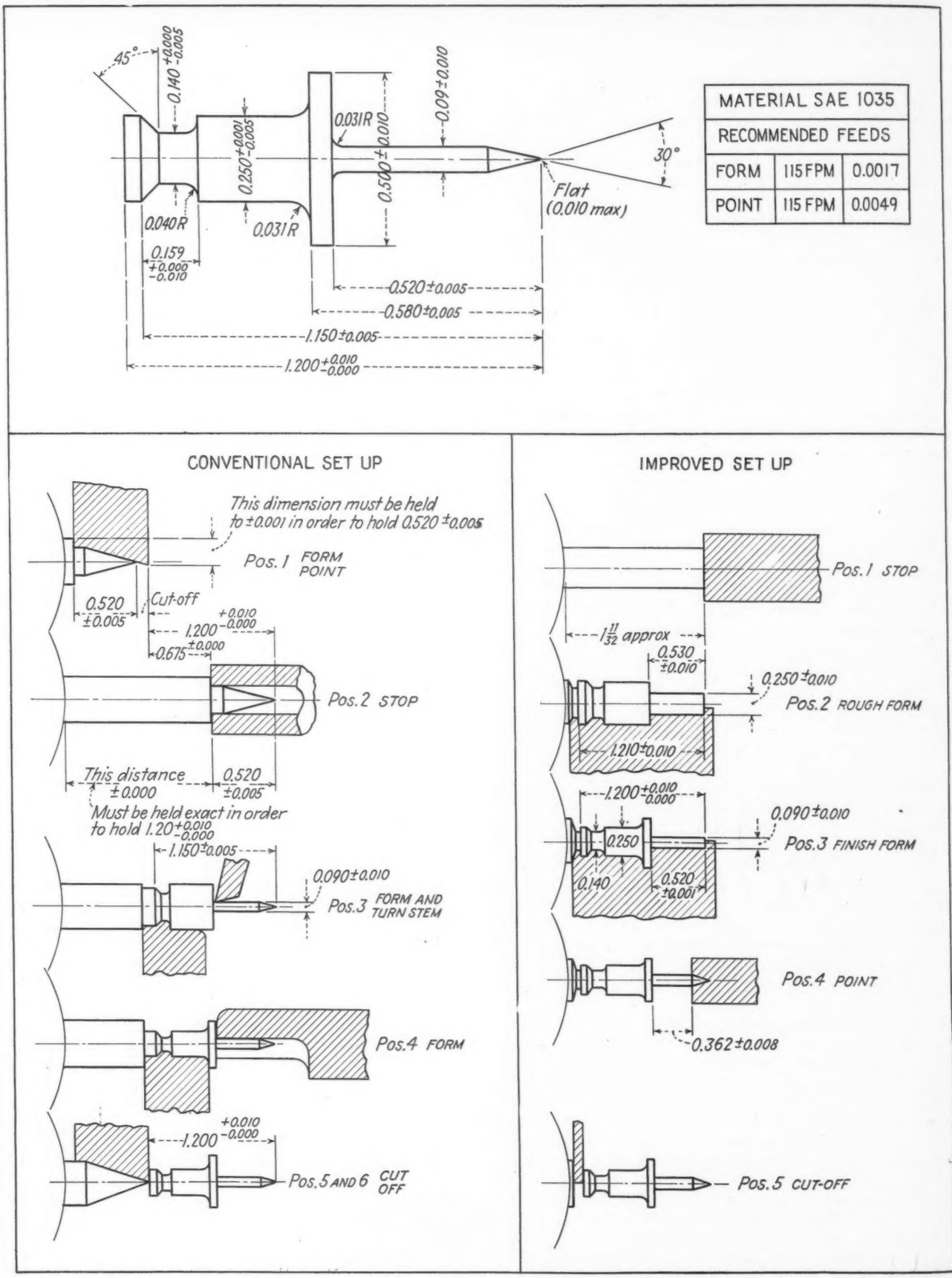


FIG. 4—Details of the Mark 31 striker with methods layout sheet showing; left, conventional procedure resulting in impossible-to-hold tolerances, and right, improved method which permitted easier tolerances but held final accuracy.

with a No. 00 Brown and Sharpe automatic. The sketch, fig. 2, gives the approximate dimensions of the part which most contractors produced in two operations. This part was sold in quantities by one of the watch manufacturers at a unit cost of $0.0125 whereas the prime contractor who was purchasing these pins was producing the same item at a cost of $0.00836, but had to pay the premium because he could not produce them in quantity satisfactorily.

This part had been originally set up so that the stem and point were the first dimensions produced. The part was turned to size and cut off. It was then bored in the second operation, but the critical dimensions could not be held. The setup was then changed so that the opposite end of the pin protruded from the machine in the first operation. In this setup the bore was completed with turret tools and the barrel faced the same way. The stem was produced with a cross slide tool and the part cut off by means of a taper attachment. Quite naturally the critical dimensions to the point could not be held but the error was difficult to detect because 20 pct of the parts so produced would pass inspection.

The difficulty lay in the fact that the government drawing allowed a tolerance of +0.010 in. −0.000 in. on the overall dimension. This was allowed primarily in order to fix the effective values of the other dimensions on the parts. It must be understood that in production it is often impossible to utilize all of a tolerance given without handicapping the possibilities of producing a part. Such a tolerance is utilized in arriving at a desirable condition which, of course, must be within the tolerance given but which utilizes only a small portion of the overall tolerance. This can best be illustrated by a form tool. This is usually made to gage maker's tolerances, yet the tolerance for the dimension that it produces may be much broader than that to which the tool is made. If the total tolerance were utilized in producing the tool there would be little uniformity to the parts produced, and setup problems would be tremendous. Therefore, by the same argument the total tolerance cannot be utilized in arriving at the overall dimension for the Mark 27 firing pin. An analysis of the pin itself indicates that the critical dimension it was intended to hold was that between the bottom of the hole and the end of the pin. Tolerances even closer than those shown could be held easily without handicapping production if the right approach were used. To do this it is merely necessary to employ a straight cutoff tool without producing a taper so as to cut the pin off to size with a cylindrical shank. By utilizing the facility of a burring attachment this part could then be picked up at cutoff and pointed by a skiving tool in a manner very similar to pointing a pencil. By so doing, production is not only facilitated but the setup is considerably simplified and less critical tolerances maintained.

The last statement may appear contradictory when it is recalled that it was stated that tighter tolerances could be maintained. Despite this apparent contradiction it can be illustrated that what has been said is true. This is so because the setup originally used attempted to maintain the tolerances given on the drawing by means of cross-slide tools. The contradictory character of these tolerances made it impossible to maintain production, and resulted in the 20 pct volume of acceptable parts. Since the overall length of the part was determined by the point at which the pin broke off from the bar, as the taper cutting tool approached the point, a tolerance of 0.010 in. would not be too much to require. Besides, there was no way of guaranteeing that the end of the pin would be flat as required on the drawing.

If the effect of the taper is analyzed it will be found that in order to maintain the ±0.002 in. tolerance on the length of stem to a clean cutoff, a tolerance of ±0.00054 in. would have to be maintained on the cross-slide. Such a tolerance is impossible on most machines of American manufacture. The reason for such a tolerance is quite obvious. The included angle of the point is 30° and this is formed by a 15° tool. The cotangent of 15° is 3.732 which is the relationship between tolerances across the axis of the part against those longitudinal to it with relation to the taper. If it is desired to maintain ±0.002 in. on the length of taper it will be necessary to maintain 0.00054 in. tolerances on the cross-slide. In contrast with this, if the pin is cut off accurately to length and then pointed the tolerance will work the other way so that an adjustment of 0.005 in. in positioning the pointing tool longitudinally will result in only 0.00266 in. change in width of point. A change in adjustment of 0.002 in. would mean only 0.001 in. change in width. Thus it can be seen that with proper utilization of the tools closer tolerances can be held more easily than much looser tolerances can be held through misapplication.

The practical application of the above situation was best demonstrated by the salvaging of 300,000 firing pins through a skiving operation in the salvage department in 20 days. This was an emergency procedure brought about by the rejection of 675,000 pins by the government after delivery. That rejection made useless the 675,000 fuzes for which these pins were intended, and the government refused payment and stopped all further deliveries until these pins could be replaced. In order to salvage these pins, and at the same time demonstrate the effectiveness of the new technique, resort was made to the salvage department where a drill press was specially rigged up with a foot treadle in order to free the operator's hands so that she could handle these minute parts.

The skiving tool illustrated in fig. 3 was designed for this application and a simple clamp provided in order to hold the pins while they were being pointed. The pins themselves were culled over in order to eliminate those which were beneath the minimum tolerance. A special grinding operation was then set up in order to bring the others to size. These were then pointed with the skiving tool in the drill press and 300,000 pins were thus salvaged in 20 days. With this set-up on a Brown & Sharpe, 600,000 complete pins could have been produced in the same time.

The Mark 31 Striker will serve to show the effect of a taper upon cumulative tolerances. This is illustrated by the methods layout sheet, fig. 4. The illustrations on the left hand side of the sheet show the setup as originally installed, which resulted in approximately 20 pct acceptable parts. It will be noted that in the operation depicted in position 1 for forming the point, the form tool is working against the taper, so that in order to maintain ±0.005 in. in the overall length of the point from the shoulder, it is necessary to control movement of the form tool into the work by ±0.0015 in., because the cotangent of the 15° angle being formed is 3.732, and a variation in advance of the tool of more than 0.0015 in. will throw the length of the point out by almost four times this error.

In position 2 the shoulder formed in position 1 is

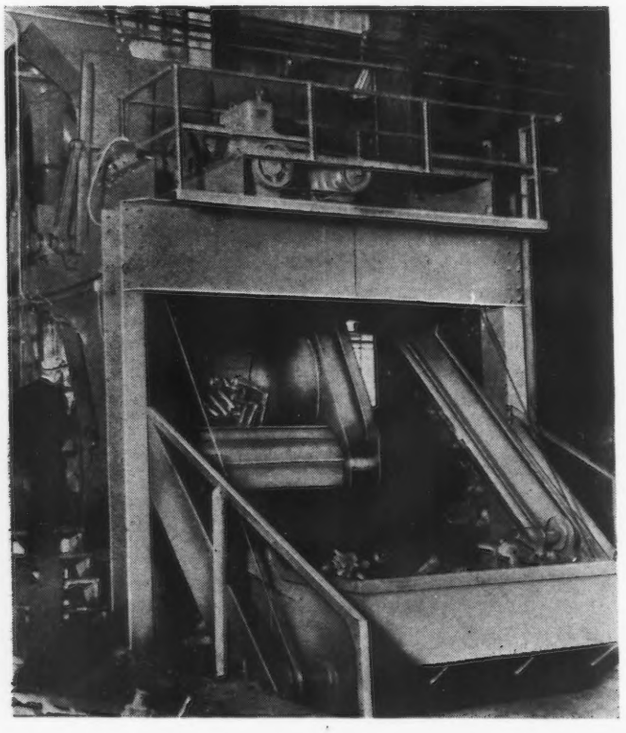
used to stop the stock for the forming operations and cutoff. An error that was originally picked up in position 1 is continued to be held in position 2. What is more, the overall length of stock from point to cutoff, which was 1.200 in. +0.010 in −0.000 in., is in the opposite direction to the 0.520 in. dimension for the length of point. Therefore, in order to maintain the 1.200 in. dimension within its tolerance, it is necessary to hold the distance from the shoulder to cutoff to 0.675 in. ±0.000 in., which is impossible. In like manner the distance from the stop to the face of the collet must be maintained on dimension, with no tolerance. It was this combination of dimensions that gave all of the trouble, and it can be readily seen to be impossible because of natural tolerances and variations. The succeeding operations are above criticism but their usefulness has been destroyed because of the impracticability of the first two operations.

In comparison, attention is invited to the layout presented on the right hand side of the illustration. In position 1 the stock is brought to stop. This length does not have to be held too accurately. In position 2 the part is rough formed to a nominal dimension with approximate overall dimension to cutoff. In position 3 the striker is finish formed without the point and with rough cutoff, leaving enough stock to support final operations. The introduction of a turning tool at this point for forming the stem might be desirable. It should be noted that the stem is not pointed but is accurately cut off to the right length. This can be easily held to a tolerance of only ±0.001 in. which is well inside the tolerance permitted. It is not necessary nor desirable to utilize the whole of the allowed tolerance.

In position 4 the striker is pointed by means of a pointing tool mounted in the turret so as to take advantage of the taper to the extent that a tolerance of ±0.008 in. will not adversely affect the results. Position 5 uses a straight cutoff tool which is easy to adjust and maintain.

It should be noted that the latter method has no really restricted tolerances or dimensions that would be difficult to maintain. That cannot be said of the former method, which illustrates the effect that tapers can have upon the production of parts.

Clean 5600 Lb. Of Castings in 15 Min.



CLEANING of 5600 lb of steel castings in 15 min in one machine is reported by Dominion Foundries & Steel, Ltd., Hamilton, Ont. The machine in which these castings are cleaned in a 60x96 in. Wheelabrator Tumblast, built by American Foundry Equipment Co., is the largest machine of its type ever built. Previously the largest cleaning unit of this type was 48x72 in., but this size was not large enough to handle some of the larger castings produced by Dominion and would not have had sufficient capacity to handle all the cleaning work. Performance of the 60x96 in. Tumblast at Dominion, shown on the accompanying illustration, has been so successful that this new large size is now included by American Foundry Equipment Co. in their standard line of Tumblasts. The giant Tumblast cleans by a combination of tumbling action and the blast effect of 600 lb of abrasive a minute. In order to hurl this amount of grit with sufficient force to remove the heavy layers of scale and sand encountered, two airless Wheelabrator blast wheels are used. These wheels, revolving at 2250 rpm, provide high abrasive velocities by means of tangential and centrifugal forces.

The following figures are typical loads for the 60x96 in. Wheelabrator Tumblast.

Quantity	Unit	Approx. total weight, lb	Cleaning time, min
56	Railroad car knuckles	5600	15
40	Journal boxes	3000	17
10	Cross members	3000	12

During the war a heavy production of suspension brackets for tanks and muzzle brakes for guns was also handled.

Fission at Bikini

[CONTINUED FROM PAGE 55]

and eye protection at 20 miles distance would have been most welcome.

(4) One bomb and one airplane did all the damage, and it would have taken a tremendous number of standard TNT bombs in air bursts to approximate the same destruction.

(5) The destruction is deceptive. After a week of examination it begins to appear far more drastic than visitations over a day or so would indicate.

(6) The bomb burst was a great disappointment to many of the experts. Immediately after detonation, General May (of the air forces) nearby in an aircraft was heard to say, "hell, that's not a Nagasaki bomb." Other air forces brass, seeing the test fleet seemingly intact after the detonation, were chagrined and dumfounded. General Farrell, second in command to General Groves of the Manhattan District during the war, one day before the test was willing to bet that eight ships would go down, and the *Nevada* would split apart like a cockle shell. (He was right in that the *Sakawa*, much nearer the center of detonation than the *Nevada*, did go down—but the hull had only one crack, and it took 24 hr to sink.) Navy men were understandably rather cocky—the skipper of the *Pensacola* bragged that his ship could have stayed in action.

(7) If the bomb had landed as planned within 200 ft of the *Nevada*, ship destruction would likely have been three times as great.

(8) Since the target array was far more dense and bore no relationship to ship arrangement at sea or in anchorage, appraisal as to what would happen to a fleet due to one atomic bomb has no meaning. Estimates can only be made as to what would happen to one ship subjected to a close (1000 yd) atomic bomb air burst.

(9) Damage was confined entirely to superstructures, and hulls of vessels suffered little or no damage.

(10) Within 500 yd of the point on the sea below the point of detonation, practically all crew personnel would have been killed by blast and heat, or would have died quickly or slowly from irradiation. Some of those deep in the ships may possibly have escaped lethal doses of gamma radiation.

(11) Within 1000 yd of the point on the sea below the point of detonation, that topside personnel not shielded from the flash heat would have died, but most of those shielded or within the ship would have survived the blast, heat and irradiation.

(12) Beyond 1000 yd, damage is freakish and unpredictable, being confined primarily to light steel panelling, fragile radar equipment on masts, etc. Personnel losses would be light. There are even certain freakish aspects much nearer point of detonation. Two destroyers within 100 yd of the *Nevada*, shielded somewhat, had no apparent structural damage whatsoever, whereas some ships much more distant had considerable topside battering.

(13) Atomic-bomb blasts are of super high temperature and of supersonic velocity but of extremely short duration. The supersonic speed prevents the searing heat from curling or sweeping around corners. There is little tendency to fire fuel, discharge ammunition or detonate bombs. Exposed powder bags in turrets (with hatches open) on the *Pensacola*, one of the closest ships to the blast, were not exploded. Paint directly in line with the blast is scorched badly, but just around a corner shows no damage. Rubberized life rafts bobbing in the water very near the *Sakawa* were scorched on the upper surface but otherwise undamaged and seaworthy.

(14) Minor fires started by the bomb blast could easily be brought under control by the crew (assuming any survive). The heavy fires on the carrier *Independence* were all primarily secondary in origin, and it is likely that a damage control team could even have kept the *Sakawa* from sinking.

(15) Outside the 1000-yd radius, even very light clothing, or the slightest shielding by heavy structures would protect personnel from the heat and possibly from the blast.

(16) There is far less residual radioactivity from an air burst than had been expected on the basis of reports from Japan. Within a few hours observers were very near ships which had been fully exposed to the bomb.

It would indeed be unfortunate if the above sixteen conclusions would in any way lull readers into the error of discounting the terror of atomic bombing. It would be a tragedy indeed if this Operation Crossroad should have become Operation Chloroform. The difficulty lies in extremists like Alexander De Seversky (smug and pampered at Kwajalein) who as the Devil's Advocate pooh-poohs atomic bombs. Or opposite extremists like William Laurence, of the New York *Times*, who have built this bomb up to something that rocks the mind. The realization that it is something less, may unfortunately force the pendulum of popular opinion dangerously to the Seversky extreme of disdain. This writer had himself expected to see some damage on Bikini only 3 miles away, and there was some mental adjustment necessary after seeing Laurence with a cool drink in his hand standing under waving palms along an unscratched beach just two days after that beach had been subjected (using his words) to the "birth of a new star" and the "heat of 9000 suns" just three miles away and two days earlier. On the word of an English Los Alamos scientist, with the bomb from the beginning, the exaggerations by science writers like Laurence have usually been on the order of a multiplication factor of 100.

The threat of atomic warfare will undoubtedly lead to alterations in Naval construction, and in fact the completion of the 45,000-ton Iowa class battleship *Kentucky* is being held up until after the results of this test and the second underwater test are appraised. The blast and heat factors of the atomic bomb might be of greater degree but are types of forces which naval architects have long considered in their design. Undoubtedly superstructures will be made of heavier steel, and more strongly braced. Topside structures will certainly be more streamlined, and ships will have greater camber to permit the quick run-off of "green water" thrown up by atomic bombs which would in all likelihood be dangerously contaminated radioactively.

This writer believes that the navy of the future will continue to be primarily a surface navy, and not composed exclusively of enormous submarines, which ap-

pears to be the current popular fancy.

The one completely new factor injected into design by the atomic bomb is that of radioactivity. It's the death ray, the invisible lethal destroyer which will pass through several feet of steel at distances 300 to 500 yd from the bomb burst. There's going to be a lot of heavy lead shielding on the future ships, with the nerve centers enjoying special protection. Complete duplicate crews may be kept deep in the ship, crammed into small living quarters surrounded by several feet of lead, alert to take over the ship from comrades who might be decimated by a surprise blast. The same force that demands all this extra protection and weight will be the same force that will permit such ship designs. For atomic power plants in naval vessels are to be expected within 10 yr, and their compactness and efficiency will be such as to permit loading on all that extra weight that the threat of atomic attack demands.

It is the radiological aspects of atomic fission which are the most frightening. Most of the rats and mice within 1000 yd of the blast had their chests caved in by the blast. Pigs and goats, having stronger chests, for the most part survived blast, but most of them were looking mighty peaked from irradiation and would die within a fortnight. It has already been mentioned that on the Appalachian 20 miles way, exposure of dental X-ray film showed negligible radiation at that distance. On Bikini island this writer fastened a piece of well-wrapped XX film behind a ¼-in. steel plate facing in the direction of the blast. After detonation this film was processed, and it showed no effect of gamma-ray penetration whatsoever. A similar film was placed on the target ship *Nevada* in such a manner as to be protected by a total of 18 in. of armor plate. On developing, this film was completely black, indicating heavy gamma-ray penetration.

The underwater blast, with the bomb located about 40 ft beneath the surface, is scheduled for late July. It will likely have serious underwater hull-crushing effect and capsizing power within a 2000-yd radius, along with long-time water contamination. It is this application of the atomic bomb that surface and underwater craft have most to fear.

That the hammered steel of capital ships stand up under atomic air blast better than Japanese cities, there is no denying. From the beginning, the atomic bomb has been more of a weapon against people rather than against structures. And, the bomb is far from its peak of development. The efficiency of the present type, made of plutonium and heavy water, will not greatly increase. But fission of other elements promise a tenfold multiplication of the terror over the next decade. Still two other new elements, Nos. 95 and 96 have already been discovered and named americium and curium, and they promise to be the ones which will split with far greater release of energy than plutonium. Or, it may be still other elements still unknown which will multiply what is already a serious threat to civilization.

The fact that the fourth atomic bomb only sunk a few ships when public expectations had been built up for wiping out the entire target area, should not blur the fact that it is an instrument of destruction far beyond anything before made by man. It is still the instrument of destruction and power which in a few decades is going to wrench the society of man into uneasy and strange new patterns. It is still the great new power which will likely escape world control, despite the best efforts of men of good will, until grim and frightening lessons have been learned, of a degree impossible for minds fully to comprehend in this turbulent and illiterate world where nations are in moral and economic conflict every day in so many ways.

New Books

"A Business of Your Own," by G. Larson, R. H. Johnson and W. M. Teller. Practical plans for selecting and operating 75 small businesses, covering retail shops as well as services, trades and manufacturing plants. Technical and financial details of each type of business are covered in detail. Prentice-Hall, Inc., 70 Fifth Ave., New York. 364 p, $3.

* * *

"Personality and English in Technical Personnel," by Philip B. McDonald. Analysis of faults in language and written reports by technicians along with corrective suggestions. D. Van Nostrand Co., Inc., 250 Fourth Ave., New York, 424 p, $3.75.

* * *

"Changing the Shape of Metals With an Engine Lathe." Not a text book, but intended to supplement existing training programs. Explains why the lathe operates as it does, and shows the precise functioning of the various parts. Shell Oil Co., Inc., 50 W. 50th St., New York. 160 p, $7.50.

* * *

"Modern Organic Finishes," by R. H. Wampler. Gives descriptions of finishing materials and equipment for their application, drying and conveying. Covering both decorative and protective organic finishes, book places chief emphasis on proper selection and use. Chemical Publishing Co., Inc., 234 King St., Brooklyn, 31. 445 p, $8.50.

* * *

"Metallurgy of Steel Castings," by Charles W. Briggs. Provides in a single source detailed information on technical and metallurgical control for steel casting production. Comprehensive coverage includes reports of very recent research efforts. McGraw-Hill Book Co., Inc., 330 W. 42 St., New York 18, 633 p, $6.50.

* * *

"Introduction to X-ray Metallography," by A. Taylor. Basic introduction to the problems of the use of X ray in the study of metals, including application of study of refractory materials and radiography of welds. John Wiley & Sons, Inc., 440 Fourth Ave, New York, 400 p, $7.50.

* * *

"Materials-Handling Equipment," by Matthew W. Potts. Defines and describes general applications of essential and more widely used types of materials-handling equipment. Pitman Publishing Corp., 2 W. 45 St., New York 19, 172 p, $2.50.

New Equipment . . .

Testing and Measuring Instruments

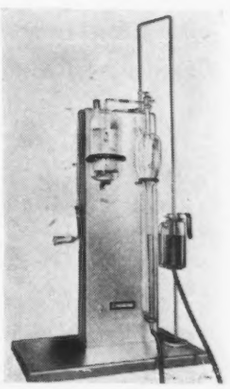
Recent developments in testing equipment and meters described in the following pages include gas and carbon determinators, wire testers, temperature recorders and control units, metal identifiers, and various measuring devices.

BOTH oxygen and hydrogen impurities in gases may be detected and measured through the Deoxo indicator, which has been designed and constructed by *Baker & Co., Inc.*, 115 Astor St., Newark 5, N. J. The instrument, which first provided, through a precious metal catalyst, determination of oxygen impurities, has since been refined for use in testing and measuring the presence of hydrogen in inert gases, nitrogen, carbon dioxide and

saturated hydrocarbon gases. It indicates the presence of from 0.001 to 1.0 pct oxygen impurities, with accuracy of indication estimated at ± 2 pct of the range in use at any time. A means of calibrating the instrument is provided and a circular chart type potentiometer-recorder and air-operated controller is available when required.

Carbon Determinator

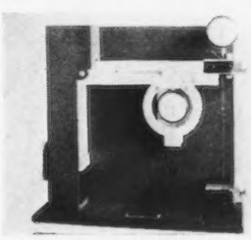
FOR analyzing the carbon in iron, steel, heat resisting steel, stainless steel and other materials, a volumetric type carbon determinator has been introduced by the *Lindberg Engineering Co.*, 2444 West Hubbard St., Chicago 12. The burette, graduated for 1-g and ¼-g samples, mounted in front of a fluorescent light for easier reading, is claimed to provide accuracy of one point of carbon, or better. The absorption chamber, combining the use of glass tubing and glass beads, permits complete absorption in two passes; for many



alloys, one pass is sufficient. A friction clamp holds the special leveling bulb positively at a point, it is said. A micrometer screw permits quick and easy zero adjustment.

Elongation Testers

TWO low-stress elongation testers for measuring the stiffness, or springiness, of large and fine copper wire have been announced by the *General Electric Co.*, Schenectady 5. The large-wire



tester, illustrated, measures elongation of wire from 17.9 to 80.8 mils in diam, and the portable fine-wire instrument tests wire from 3.1 to 17.9 mils in diam. The testers are said to be useful for determining whether a wire possesses the proper degree of flexibility for use in such winding processes as the manufacture of coils, and make possible a comparison between wire of the same or different sizes on the basis of elongation. When the large-wire tester is used, it is said only 30 sec are required for testing after a few adjustments are made. Elongation is recorded on a large micrometer dial.

Metal Identifier

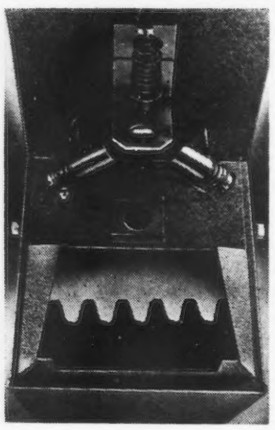
A PORTABLE instrument, known as type B Metalsorter, which identifies and sorts pure metals, steels and nonferrous alloys, has been manufactured by the *Control Equipment Co.*, 547 Brushton Ave., Pittsburgh 21. The Metalsorter employs the tribo-electric effect. A metallic specimen of standard, known, or acceptable character is rubbed against the

surface of an unknown or doubtful piece. If a chemical or metallurgical dissimilarity of the two pieces exists, a minute electrical current is generated and is registered by an indicator on a calibrated scale. This device can be used on all shapes and sizes in the mill, warehouses, receiving and shipping platforms, laboratory, or production and assembly lines. Since the test is nondestructive it may be applied to the identification of built-up machinery and aircraft assemblies and structures. Electrical connection to the pieces

is automatically and simultaneously made with each test.

Contour Comparator

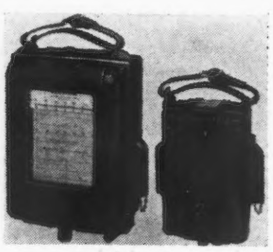
USED for comparing or examining screw threads, dies, gears, and parts of instruments, profiles, etc., and suitable for production inspection of parts not easily checked with conventional gages, the Fish-Schurman optical contour comparator has been announced by the *Sheffield Corp.*, Springfield and



Thomas St., Dayton 1. The standard model comparator has a 25 to 1 amplification, while interchangeable 13 to 1 and 50 to 1 optical systems are available as accessories as well as other special amplifications. An enlarged image of the part being checked appears on an adjustable mat glass screen 9 x 14 in. A centering device enables the master pattern to be adjusted to the work. Accurate projection of the contour of the part being inspected is instantaneous, it is said. All operations can be carried on under normal lighting.

Temperature Recorder

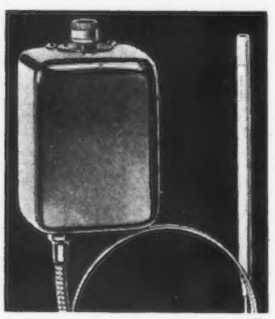
ANNOUNCEMENT of an inkless temperature recorder, designed for use with resistance temperature detectors already installed in generators, transformers, and



other electrical apparatus, has been made by the Meter & Instrument Div. of the *General Electric Co.*, Shenectady 5. The instrument can also be used with separate detector units to record temperature in ovens, heat-treating tanks, refrigerating machines, air ducts, and liquid handling systems. The temperature recorder, designated as type CF-2, consists of a portable recording instrument and an external power-supply unit. The equipment records by means of an inkless recording mechanism on a 4-in. strip chart the temperature variations that produce resistance changes in standard, 10-ohm RTD's. With a chart length of 65 ft, the driving motor can be adjusted, it is said, to provide record length of from 8 days to 2 yr on a single chart.

Temperature Control

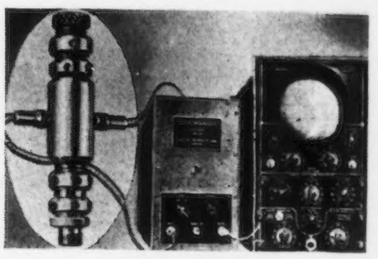
ESPECIALLY designed for industrial applications requiring accurate control of temperatures over narrow calibrated ranges, a low-cost remote-bulb-type control has been announced by the *United Electric Controls Co.*, A and Athens St., Boston 27. This in-



strument can be used for all liquids or gases noninjurious to brass, or for metal to metal applications, and can be equipped with ambient temperature compensation. Thermal assemblies can be plated or supplied in stainless steel for applications injurious to brass. Control is based on a snap-action switch actuated by a solidly liquid-filled copper thermal assembly. Adjustments are by either knob and pointer with calibrated dial, or by screw driver.

Pressure Indicator

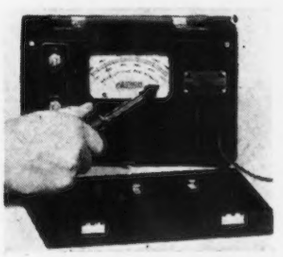
TO use for studies of internal combustion engines, pumps, compressors, air and liquid pipe lines, etc., an instrument, known as the Pressuregraph, has been brought out by *Electro Products Laboratories*, 349 West Randolph St., Chicago 6. The instrument provides, with a cathode ray oscillograph, a substantially linear pressure-time curve on the screen, which indicates the performance of the engine, pump, or other device subject to pressure variations. It shows instantly, it is said, the



erratic operation of a device which normally cannot be observed by other means, due to inertia of flywheels, and other factors. In addition to dynamic pressure variations, it shows static or slow pressure variations, and covers all mechanical speeds, and pressures up to 10,000 psi.

Overspeed Tachometer

AVAILABLE for testing overspeed protection on turbo-electric generators and similar machines in power plants, is the type 48A tachometer produced by the *Metron Instrument Co.*, 432 Lincoln St., Denver 9. This portable tachometer has two ranges for testing either 1800 rpm or 3600 rpm machines. The accuracy on both ranges is said to be ¼ of 1 pct. It is simple to use since there are only 2 controls, an on-off switch



and a high-low range switch. Operating power of the instrument is obtained from an ac source of 105 to 125 v, 60 cycles. The head, which is very small and requires only ¼ in. oz to rotate, is a positive acting switch, so that the meter indication in the bridge circuit is directly proportional to the number of switching operations per min of the head. The tachometer contains no vacuum tubes or other limited-life components.

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IF sheet metal deliveries are all that is holding up your production, you can quickly give your plant the green light. Revere magnesium alloy sheet can be shipped to you in short order. It comes in a variety of standard sizes and gauges or it will be produced to your specifications—in either of two qualities: Commercial or Aircraft.

This means not only that you can start producing without further delay, but also that you can market a new, improved product without extensive redesign. For Revere magnesium alloys, with nearly the strength of steel, are so feather-light that they often eliminate from a product one-third to one-half of its weight.

Such products offer new values to the user, tend to rise above competition and command more attractive selling prices. That is why Revere magnesium alloy sheet can help you produce *now* at a profit!

Revere magnesium products include sheet, plate and strip, rod and bar, pipe and tube, extruded shapes, and forgings. Revere aluminum alloy products include pipe and tube, extruded shapes, and forgings. A Revere Technical Advisor will gladly consult with you about the application of these metals to your business. For prompt service on magnesium sheet call Revere today.

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Like other metals, magnesium is priced by the pound. But a pound of magnesium is so much greater in volume and goes so much further that a price comparison on a cents-per-pound basis is misleading. Always compare magnesium's cost with that of another metal after first finding how many pounds you will save with magnesium. You will likely discover that Revere magnesium alloy is entirely within your reach.

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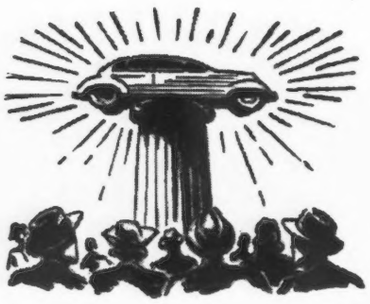
Assembly Line . . .

WALTER G. PATTON

• Motor car output hits new high . . . Chrysler has labor trouble . . . Time is all-important factor in mass production.



DETROIT—During the past week the automobile industry turned out more motor cars and trucks than during any week since reconversion. Total number of cars and trucks produced was 72,995 compared with 45,175 during the week ended July 5 and 114,318 during the corresponding week of 1941.

Three critical shortages have appeared and the now distinct rumblings of labor have had the effect of discounting somewhat the otherwise bright prospects for the third quarter.

Pig iron has emerged as the winner of the doubtful distinction of being the shortest item on the supply list. It is now reported that a second major car producer is on the verge of closing because of a lack of pig iron. Seat cushion springs are still short and this situation gives no indication of improvement. A hurry-up call has been sent out for cereal flour used as a binder in foundry blown cores. This situation is reported to be particularly critical at the moment.

For the past several months Detroit and particularly Chrysler have enjoyed reasonable freedom from labor trouble. It is significant, therefore, that a rash of wildcat strikes broke out at Chrysler this week while other manufacturers are apparently having a minimum of trouble.

The UAW-CIO explains the work stoppages at Chrysler as being caused by the speed-up and poor ventilation in certain departments while the company counters by insisting that working conditions were never better in Chrysler's history.

It has been noted, however, that a wage demand on a motor manufacturer is often built-up by a series of work interruptions and since Chrysler has been marked for a new wage demand the "heat strikes" may be, as some company officials have charged, a method of building up steam to strengthen the union's forthcoming demand for increased wages.

One motor executive who has followed labor developments in this area rather closely has noted that a favorite tactic of Walter Reuther is to use what he calls a "strategy of turbulence." Reuther, he charges, can always be depended upon to upset the industry just about the time that prospects for continuous production appear o be brightest. Whether this judgment is justified or not, this opinion is widely held by Reuther's critics and is one of the chief objections to the present union leadership.

For the present, however, the Chrysler labor skirmish may be properly evaluated more as a war of nerves than as a labor impasse although it can and will become serious if the union injects a health fund or some similar demand into the present wage negotiations. The strike vote which was taken this past week by the specially assembled Chrysler conference was primarily a measure taken to dramatize an unsatisfied grievance about working conditions rather than a serious complaint against Chrysler.

A FACT which seldom registers on outsiders looking at the automobile industry is that it takes *time* to mass-produce anything! If this fact could be posted in a prominent place where prospective car buyers, labor leaders and even management itself could see it every day for a month, the automobile industry would have a much easier time than at present. A simple analogy will demonstrate the point.

In the case of a car equipped with hydraulic transmission, when the driver steps on the accelerator the car moves slowly at first and then begins to pick up speed. Not until the car reaches a certain ground speed does the car shift into second gear. Gradually the car picks up more ground speed and eventually shifts into high gear. In high gear the car operates in an efficient manner.

Thus far, the competition for raw materials by all industries, strikes in suppliers plants, the steel strike, the coal strike and the interruption in rail movements have combined to keep the automobile industry out of high gear and until the industry achieves near capacity operations, the benefits ordinarily associated with mass production are not going to be realized.

Failure to recognize that automobile production must go up a step at a time rather than by big jumps has led many prospective car buyers to feel that the automobile industry is unbelievably slow in getting production up to expected volume.

THE record will show, however, that the industry required 9 yr from 1900 to 1908 to increase its output from 4192 to 100,000 units. The million mark was not reached until 1916 or 8 yr later. The industry first produced 2 million cars and trucks in 1920. By this time, production methods were fairly well established and materials were readily available in a highly competitive market. Also, the labor situation was well in hand and production managers were relatively free to make changes which would increase output and cut costs. With these favorable conditions, the 4 million mark was reached first in 1923. The 5 million mark was exceeded only in 1929.

Another case in point is the aircraft industry. With the entire resources of the country behind it, the aircraft industry was not able to build in mass production a single plane designed during World War II.

Fundamentally, the problem goes back to the true concept of a mass

Machine comes equipped with belt guard.

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Where manufacturing operations require burring, filing, sanding, grinding, wire-brushing, or polishing the KELLERFLEX has proved that it does the job faster and better.

For operations where high-speed tungsten carbide burs are used Pratt & Whitney now offers the new KELLERFLEX machine. These are some of its fine features: speeds under load of 9600, 16800, 24000 and 33600 R.P.M. obtained with a minimum of cable wear, by increasing the tool-speed at the hand-piece end . . . a stable floor stand with easy-rolling casters . . . a heavy-duty ½ HP electric motor with simple belt adjustment . . . adjustable clamp to set height at the most convenient working level . . . 360° horizontal swivel . . . and a full vertical swing.

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production plant as a highly specialized machine tool—an integrated arrangement of bricks and mortar and machines and conveyors and manpower designed to do a specific job *in a specified period of time*. Ability of this machine tool to function efficiently depends on perfectly coordinated effort. The material must arrive in planned quantities at just the right time. Conveyors must be perfectly timed. Each highly specialized machine tool must turn out parts at a predetermined rate and all of these parts must arrive in proper order and time at assembly lines. Only when all these conditions are met on schedule will large-scale output be possible.

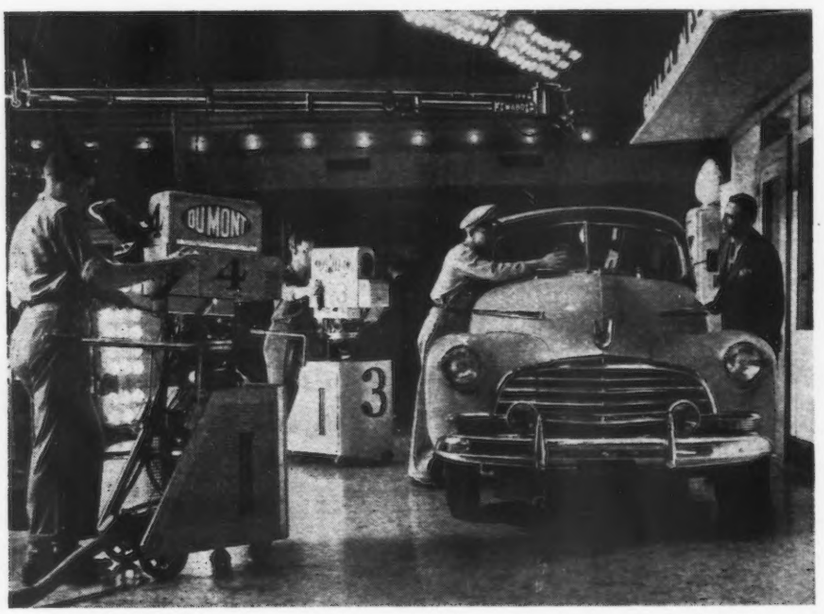
Thus, far, material shortages and inability to time operations properly have kept automobile plants almost continuously in low gear. Only now does the industry appear to have reached a point where it may be able to shift, figuratively speaking, into second gear. It still has a long way to go before the industry shifts into high, at which time output will be expanded greatly in fairly brief periods of time.

It goes without saying that the real economies which have long been associated with mass production will only begin to be realized after plants have been running for some time near capacity. Then, for the first time, plant managers will be able to concentrate on cost cutting details, a most necessary function if cars are to be produced at expected cost levels.

Another factor which is expected to influence automobile output and production costs in the months ahead is the fact that never before in its history has the industry had so little control over the materials and labor it uses. Thus even though ways and means may be found to cut costs, it may not be possible to do anything about it. For example, the formidable opposition the industry is meeting in its efforts to increase production line speeds may greatly handicap the industry in its efforts to produce large numbers of cars at low cost.

The present state of industry planning and control is well illustrated in a report just released by a large automobile plant. This particular automotive producer has experienced 603 different supplier's strikes during the past 6-month period. Recent plant inventory showed there were bumpers enough for 2300 vehicles but batteries for only 44; generators for 799 but starters for only 587; fans were available for only 127. The wheel shortage was so bad that the arrival of a truckload of wheels at 9 a.m. was the only thing that averted a shutdown of assembly lines.

In view of the importance of timed operations and balanced plant inventories it is readily understandable why the automotive industry produced only 27 pct of its anticipated output during the first half of this year.



FIRST TELEVISED SHOW: *Shown above is a scene from the second of a series of four weekly shows entitled "Roads To Romance" which was staged by Chevrolet and broadcast through the facilities of the American Broadcasting Co.'s television network. Admittedly an exploratory venture, the Chevrolet broadcasts were the first sponsored by any automobile manufacturer.*

Files Back Wages Suit

Detroit

• • • A suit calling for the payment of $3 million in back wages has been filed against Continental Motors Corp., Detroit, in behalf of 112 production employees.

The suit charges the company did not pay $1,500,000 in overtime pay in violation of the Fair Labor Standards (Wages and Hours) Act which established 42 hr as the basic work week until Oct. 23, 1940, and 40 hr thereafter.

Approximately 7000 other industrial employees of other firms doing similar work will be affected if the employees win, Ned L. Smokler, attorney for the 112 employees said.

Freight Delivery Delayed

Chicago

• • • Saturday closing of industry of mercantile concerns has become so general that the congestion of freight houses and delivery platforms is seriously retarding freight delivery services and freight car turnaround, according to Col J. Monroe Johnson, director of the Office of Defense Transportation. He warned that the nation would be faced with a more serious shortage of railroad cars and equipment in September and October than at any time encountered during the war.

Box car loadings have been climbing steadily and according to the AAR, 392,000 cars were loaded in the final week of June. It is estimated that more than 300,000 of the nation's 1,770,000 freight cars of all kinds should by normal standard have been retired from service. New cars are not being built to maintain replacement because of the shortages of lumber, steel and other materials.

After a blustering New England hurricane, hundreds of the best parking meters ever installed on Main Street were found to have been rendered useless "overnight" by corrosion. The parking meter manufacturer found his reputation at stake—so he turned to Stainless for weather-proof meter parts that could lick hurricanes along with everyday usage.

Now parking meter mechanisms are made of this Stainless, long ago made easier-to-machine, and more ductile to form, by Carpenter. And you can get that same kind of product dependability—with lower fabricating costs—by using Carpenter Stainless Steels.

Whenever you have a special problem involving resistance to corrosion, heat, wear, etc. —get in touch with Carpenter. When you want to reduce the cost of machining Stainless parts, specify *Carpenter* on your orders for Free-Machining Stainless bar stock.

FOR SHORT CUTS to making finer products at less cost, ask for your copy of "Working Data for Carpenter Stainless Steels". A note on your company letterhead is all that's necessary. Drop us a line today.

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Washington . . . L. W. MOFFETT

• Junkie's return to scrap collection in remote areas, dealers say, would be big boost to overcome shortage and quiet mills' complaints.

WASHINGTON — What the country needs is the fellow with a horse and wagon—with a bell on the horse. (This fellow is just the plain junkie.)

This anyhow is the contention of the scrap dealer. Steel producers contend that the problem is not so simple. In mixing it with the scrap industry, steelmakers charge that scrap is being withheld from the mills in the expectation of higher prices.

In any case, however, it is conceded that jingling of the bell proclaiming return of the junkie to the highways and byways would be most welcome. It would bring in tonnage. Dealers declare that it is tonnage that is necessary to stimulate movement to mills.

To get the junkie, bell-bedecked old Dobbin and wagon back to the old haunts, it is readily agreed, will take more than another one of those touted "intensive" drives such as CPA again is trying to get underway. The junkie, it is emphasized, must have a realistic stimulus. This is to say that he will have to be assured that he is not engaged merely in a sentimental journey but will be rewarded for his trip. If he prefers to give Dobbin a rest and modernizes his calling by using the truck that is even better, it is urged. The point is made that this remote scrap must be gathered if steel production is to be kept going at a high rate.

It is insisted that there will have to be a reversal of OPA's position of June 12 when it refused to adjust the scrap schedule and permit upping of prices. OPA said that higher scrap prices would aid inflation. Scrap industry sources say that it guessed wrong in this instance just as it was off the beam in January when it said that the flow of scrap by spring would be so great that prices would decline. Without OPA and with a "free economy" dealers look for upward revision of prices which they hope will attract the junkie to the scarcely traveled trails once more. Dealers say they are not seeking across-the-board boosts but do want adjustment of prices for some grades.

IT IS pointed out that industrial and railroad scrap is flowing fairly well but that the little peddler and little dealer are out of business because of inadequate schedules and related reasons. Yet they are looked upon as marginal suppliers who, when given the necessary incentive, tip steel production upward. He gets his materials in the rural areas. It is not known what amount of scrap there is in the country except that it is known to be large. It is badly needed in the furnaces and cupolas. Instead it is in farm fields where it is gathering rust that ought to be converted into steel. If supply exceeds demand, it is declared, prices naturally can be expected to take a downward turn.

Battle scrap can be written off. The Army is not going to bring in any except as ship ballast. And even if it did it would be so small in tonnage as to be unimportant.

Dealers who are urging a brisk back-to-the-farm-for-scrap movement point out that scrap still is doing business on a 1941 basis, except for a few slight revisions. No. 1 heavy melting steel remains at $20, and it is contended prices in cities and basing points might be high enough but the little fellow must get going, they insist. He must be encouraged, they say, to hitch old Dobbin to the old wagon, drape a bell around the critter's neck, and jingle his way over remote paths gathering scrap as he goes.

* * *

ANNOUNCEMENT on July 9 of the withdrawal of the so-called "American Black List" brought to an end one of the most far-reaching "economic sanctions" ever imposed by this country. Its purpose was to bar from trading with the United States any firm or individual who was engaged directly or indirectly in transactions with enemy countries.

Demise of the black list was ordained by a State, Treasury, Commerce and Justice Dept. jury just eight days short of its fifth anniversary. The action was approved by the British and Canadian governments which are withdrawing their own lists, virtually identical with the American roster.

Now shrunken to a total of 5887, the American list had climbed to a peak of 15,446 names in July, 1944. It had its beginning on July 17, 1941 when, acting under authority of an act of Oct. 6, 1917 and another of July 2, 1940, the president issued the original list of 1834 names. All the original names were those of individuals or firms in the Western Hemisphere but the outbreak of war in December added thousands, embracing the entire globe.

Following VE-Day, a noticeable decline took place as those blacklisted either broke off connections objectionable to the United States or were classified by this country as minor offenders and as such relatively unimportant.

One of the major factors contributing to the withdrawal was the agreement with Switzerland for liquidation of Nazi assets. Switzerland insisted on withdrawal of the black list. Similar agreements with other nations are in prospect and this would have the effect of making the list highly impotent if it were lifted in some countries and not in others.

World's largest open hearth gets a RAMIX bottom

THIS All-Ramix hearth was installed in one of Weirton Steel Company's 400-ton open hearth furnaces last November. 124 heats had been tapped from it on April 1st, and as with all the other Ramix installations at Weirton, this bottom is in excellent condition.

Where it would have required 12 to 14 days to burn in a conventional magnesite hearth, this Ramix job took only 144 hours, from the start of cold ramming to the charging of the hot furnace, with hearth fully matured and slagged. Two shifts of three rammers each operated air hammers, without interruption, for 62⅓ hours, to ram the 156½ tons of Ramix required. The refractory was mixed in a cement mixer and a complete set of forms was used.

This was the seventh Ramix hearth put in at Weirton—one of over 300 in the open hearth industry—many installed under the personal supervision of Basic Engineers. Success with cold rammed hearths at Weirton, as at 144 other open hearth and electric shops, is the result of three important factors: (1) use of the right material; (2) correct installation procedure, and (3) good maintenance practice.

The services of Basic Refractories Engineers are available to any steel company, for advice and help on refractory problems. BASIC REFRACTORIES, INCORPORATED, 845 Hanna Building, Cleveland 15, Ohio. *Exclusive Agents in Canada:* Refractories Engineering and Supplies, Limited, Hamilton and Montreal.

BASIC FURNACE

REFRACTORIES

Left: Forms in place for ramming the flat in the 400-ton Weirton furnace. Right: One end of the furnace with ramming partially completed. Ramming started at 11:10 a. m., Nov. 23rd; ramming of banks finished at 1:30 a. m., Nov. 26th; elapsed time 62 hrs. 20 min.

"Withdrawal of the proclaimed list does not in any way constitute a termination of or slackening of the program for the permanent elimination of Axis external influences in either this or the Eastern hemisphere," the State Dept. said in a prepared statement.

Nor, continued the formal announcement, does abolition of the black lists unfreeze the accounts in this country of all persons formerly on the list or imply that the persons formerly black-listed are to be "regarded as satisfactory agents for American business."

The official statement was supplemented by Acting Secretary Dean Acheson at a press conference who observed that under various inter-American agreements, including that of Chapultepec in 1945, the American republics are cooperating in eliminating all Axis influences in the Western countries.

Asked concerning controls over trading with German firms in Argentina, Mr. Acheson said that among these is the Commerce Dept.'s power to require licenses for export.

In addition to Switzerland, arrangements have been made with Sweden to liquidate German-owned or controlled interests and discussions with Spain and Portugal along these lines will be resumed shortly. Admitting that withdrawal of the list might weaken the bargaining position of America to some extent, Mr. Acheson said that there are other talking points which cannot be commented on at present.

ALL research and development activities of joint interest to the War and Navy Depts. will be coordinated by the recently established Joint Research & Development Board, headed by Dr. Vannevar Bush, president of the Carnegie Institution of Washington and director of the Office of Scientific Research & Development. Navy representatives on the board are Assistant Secretary W. John Kenney and Admiral DeWitt Ramsey, Vice-Chief of Naval Operations. The Army representatives are Gen. Carl Spaatz, Commanding General of the Army Air Forces and Gen. Jacob L. Devers, Commanding General of the Army Ground Forces. Dr. Lloyd Berkner of the Carnegie Institution, a former naval officer, is executive secretary.

The board is charged with the establishment and carrying out of a strong, unified, integrated and complete research and development program in the field of national defense.

The board will encourage direct dealing among the various agencies of the War and Navy Depts. which are concerned with or interested in the results of research and development activities. It also will invite the National Advisory Committee on Aeronautics and interested governmental agencies to participate in the efforts of the board to coordinate such activities.

•

Commerce Dept. Opens New Information Office

Washington

• • • **Consolidating the work** of the Office of the Publication Board, the Technical Industrial Intelligence Branch, the National Inventors' Council and the Production Research and Development Div., the Dept. of Commerce has announced the establishment of an Office of Technical Services, headed by John C. Green.

According to Mr. Green, who has served as Executive Secretary of the Publication Board and Chief Engineer of the National Inventors Council, the office will continue the work of the consolidated units and launch a new program of technical aid to business and industry. The 1946-47 appropriation, just approved by Congress, includes increased administrative funds for the new office, as well as $1.5 million for research and development.

OTS will consist of four major units: The Invention and Engineering Division, the Industrial Research and Development Division, the Library and Reports Division, and the Technical Industrial Intelligence Division. The last-named is responsible for investigation of German industry and the collection of German scientific and technical information.

Mr. Green has gone to England to attend an international conference on German patents. He will also spend several days in Germany inspecting OTS activities there.

THE BULL OF THE WOODS — BY J. R. WILLIAMS

THANKS, I HADN'T MISSED 'EM YET-- THANKS!
I KNEW RIGHT AWAY THEY WUZ YOUR SPECS, CUZ I SEEN YOU BEND DOWN THERE AN' I SPOTTED 'EM JIS IN TIME, CUZ THEY DUMPED A LOTTA STUFF THERE AN' I-I--
WHAT'S HE TRYNA DO, GET A PROMOTION UP TO A FOREMAN FER FINDIN' A PAIR O' SPECS?
IN A BIG SHOP YOU'RE SEEN, BUT NOT MUCH CHANCE TO BE HEARD-- SO YOU'D BETTER GRAB ANY CHANCE!
CAN
7-19
J.R.WILLIAMS
T. M. REG. U. S. PAT. OFF.
THE OPPORTUNITY
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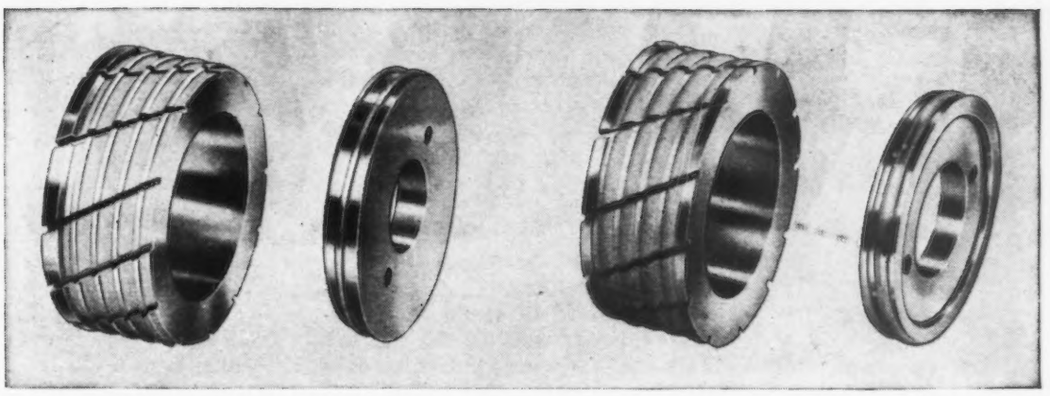
SHEFFIELD MACHINE TOOL DATA

MFG #111

CRUSH GRINDING CUTS MANUFACTURING COSTS OF SMALL AND LARGE SCREW CAP FORMING ROLLS



From left to right – (1) Crusher roll for truing the grinding wheel used to produce the internal die; (2) The resultant internal die; (3) Crusher roll for external die; (4) The external die.

The inner and outer rolls or dies used to roll the thread on jar lids have heretofore been made by chasing on a lathe with a tool formed to the desired thread profile. The rolls are then heat treated and polished. Distortion of form occuring in heat treating is a common cause for rejects.

This problem has been eliminated, production time greatly reduced and uniformity of quality assured by the following methods:

(1) Crusher rolls to desired thread profile are made on standard H.S.S. blanks with the Sheffield Micro-Form Grinder.

(2) The resultant crusher roll is used to dress a 120 grit wheel on the Sheffield Precision Thread and Form Grinder

(3) This Sheffield Precision Thread and Form Grinder is then set up to grind the dies in quantity with two passes of the grinding wheel over the work.

While it was possible to produce the form in a single pass at reduced work speed, the most desirable combination of production time and product finish was obtained by taking two passes, one for rough grinding and one for finish grinding.

In grinding, two parts were placed on an arbor. Total grinding time per part was slightly under 4 minutes. Approximately an hour's labor per die is saved by using crush grinding on Sheffield equipment, and the die so produced is more uniform in quality and the finish is better.

Thousands of other production cost problems can be answered satisfactorily by crush grinding with Sheffield equipment. Write for Bulletins M-100-145 and M-120-144.

THE SHEFFIELD CORPORATION

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West Coast . . .

ROBERT T. REINHARDT

• Application of U. S. Steel Corp. for lower freight rates from Geneva develops ramifications . . . WAA offers complete magnesium plant for sale or lease.

SALT LAKE CITY—Announcement that U. S. Steel Corp. has applied for an $8 per ton freight rate on finished steel from its Geneva, Utah, plant to Pacific Coast points has created almost as many repercussions and chain reactions as did the detonation of the atom bomb at Bikini.

Long anticipated by the steel producing and consuming industry, this appeal for a more favorable freight rate westward has already started a series of actions which will probably result in cheaper steel for West Coast users, lower raw material and finished steel rates for the Fontana, Cal., steel plant, increased revenue for western railroads and a reduction in freight rates on steel throughout the country. These conclusions are accepted by several well-informed traffic men in the West.

Steel users on the West Coast have long complained of the freight penalty they must pay for their geographic position in relation to eastern competitors and have cited this situation as the cause for retarded industrial development. Full peacetime operation of Geneva coupled with a low freight rate has been the great white hope of many fabricators who are now backing the corporation's proposal with all they have.

E. G. Plowman, vice-president of U. S. Steel Corp., stated that in addition to the $8 rate to Pacific Coast points his company was asking for export rates to Gulf and south Atlantic ports of $8.40 and $10.40 per net ton respectively on finished steel and $8.61 and $10.85 per gross ton respectively on semifinished products.

Proponents for the continued peacetime operation of Geneva have long recognized that because of its land-bound position, its profitable operation was dependent to a large extent on a satisfactory freight rate somewhat lower than the theoretical rate of $12 per net ton published but not used during the war because of government shipments moving under the special $8 rate. However, with railroads asking for increased rates nationally and shipping lines hopeful that they will get them so as to justify higher water rates, there is considerable question just how far down the scale the rail carriers will be willing to go.

SOME traffic men contend that on a basis of ton-mile rates, the $8 rate is justifiable and that it would put the Utah-Pacific Coast haul in a comparable position to other parts of the country and would not be justification for lower rates elsewhere. One thing is certain thus far: Henry J. Kaiser has already used the application of U. S. Steel as the basis for an appeal for a similar rate on shipments from Fontana to points in Utah, Texas, Arizona and Pacific Coast points. Informed sources state that if the lower rate is granted to the corporation, the Kaiser interests will not oppose it, but will instead ask for the same percentage reduction on inbound shipments of coal from Utah and iron ore in California.

It is no secret that the railroads, having experienced profitable steel hauls during the war when water shipments were out of the picture, would like to keep as much of this business as possible. It is conceded that this factor alone will have an important bearing on the final decision of the carriers.

Meetings of the western freight tariff bureaus here and in Seattle last week failed to develop any decision by the railroads as to the acceptability of the lower rate. Another meeting of the Pacific bureaus is scheduled for July 31 in San Francisco at which time the entire matter will be opened for public review. The principal roads affected are: Union Pacific, Denver & Rio Grande Western and Southern Pacific.

Full operation of Geneva would produce approximately 900,000 tons of semifinished and finished steel per year which is alluring the freight. Just how high the rate can be and still permit profitable operation of the plant at present or lower Pacific Coast prices is the question to be determined. It is certain that western steel users will back the corporation as strongly in this application as they did the movement for the continued operation of the Geneva plant.

Present indications are that the plant will get into full ingot production even faster than the most optimistic local observers had predicted. The second of the four batteries of coke ovens and the second of the three blast furnaces went into operation last week. With three of the nine openhearths scheduled to start steel production in a week the slabbing mill, plate mill and structural mill are expected to roll soon thereafter.

LOS ANGELES—Donald M. Nelson, former chairman WPB and now president of the Society of Independent Motion Picture Producers, is still keeping a watchful eye on the industrial situation. In an interview last week Mr. Nelson recommended that Pacific Coast industrialists should give serious consideration to the establishment of plants in the Orient. He stated:

"Development of China's industrial potential, particularly the steel and textile industries, will have a far reaching effect upon the Pacific Coast economy. American industry, instead of manufacturing goods here and trying to sell them in an impoverished world, should establish branch plants in other countries, train and supervise workers, and help build up an econ-

FORMERLY: Separate hardened race pressed on axle.
WITH TOCCO: Surface hardened to 62 R. C. at the bearing, axle acts as its own race. Increased diameter gives 50% more strength.
Bearing Race PRESSED ON
Bearing Race PRESTO!

50% stronger axles with TOCCO Induction Heating

AXLE shafts can serve as their own bearing races when the surface is given superhardness by TOCCO Electrical Induction. This eliminates the separate inner bearing race formerly pressed on . . . and by increasing the axle diameter at the bearing gives 50% more strength.

One TOCCO installation, hardening 300 axle bearings per machine per hour, has paid for itself from savings within a few months. The high quality of results is attested by millions of these axles now in service.

For YOUR Problem. This technique for producing integral bearing races can be applied to machine parts of many types and sizes . . . to quicken your race to market and to give you better products at lower cost. TOCCO simplifies production these ways: Cuts heating time to seconds; eliminates straightening, scale cleaning and other operations; banishes rejects; enables you to spot heat-treating in the production line; gives you 100% uniformity of results with unskilled operators.

Enlist the TOCCO Engineer in *your* production problems. No obligation. Mail coupon for free booklet.

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omy in those countries which will provide an increased market for American made products."

Mr. Nelson particularly singled out China as an example. He indicated that proximity of Pacific Coast ports; the adaptability of the Chinese to American factory methods and procedures; and the huge potential market should encourage manufacturers here to look to the Orient for expanding markets. Speaking of the metalworking industry, Mr. Nelson pointed out "a tremendous need for all sorts of transportation facilities — trains, passenger cars, trucks, rails, etc.— which could be manufactured there." He suggested first the establishment of assembly plants in China, to be followed by the manufacture of the finished product. "Technical and financial assistance of American manufacturers is essential during the developing stages, but the aim should be eventual control, operation and ownership by the Chinese," he said.

* * *

Menasco Mfg. Co. of Burbank, Cal., has received $2,400,000 in contracts from the U. S. Army Air Forces for additional gas turbines and jet engine work. Menasco's backlog is now more than $8,400,000 it was anounced by John C. Lee, president. The work is of an experimental nature and under military restrictions. Hydraulic landing gears, washing machines and hydraulic jacks for automotive, industrial, aircraft and railroad use are included in the company's backlog.

* * *

Helicopter mail service, undergoing a 30-day trial run here, promises faster postal service by speeding intercity mail deliveries almost 12 hr. A shuttle run from airport to central postoffice takes only 12 min against 45 min by truck. The trial runs include a daily round trip through outlying Los Angeles communities, another through closed-in areas and frequent airport to downtown post office shuttle trips. Sikorsky helicopters, capable of a maximum load of 580 lb of mail, are being used for the tests.

SAN DIEGO—Ryan Aeronautical Co. has entered another field of stainless steel products according to T. Claude Ryan, president. Alloy metal casket shells are now being manufactured with orders for 20 carloads valued in excess of $350,000 on the books. A large-scale manufacturing program is being scheduled and the plant is now tooling up for volume production with a goal of 1000 caskets per month by this fall. Design and engineering work evolved the use of chrome nickel alloy casket shells for initial production with copper and bronze shells to follow.

SAN FRANCISCO — Hailed as an encouraging sign along the trail to greater industrialization of this area is the announcement that the W. R. Ames Co. has been awarded a contract to manufacture metal kitchen cabinets for the General Electric Co.

This is a departure into a new field for this organization which for many years has been the producer of portable irrigation pipe. Approximately 4000 cabinets a month will be manufactured which will require about 125 tons of 22 to 24 gage cold-rolled sheets. Present equipment of the plant including breaks and spot welders will be used. The present payroll of 150 men is expected to increase to 200 under full production. Cabinets will be finished in baked enamel.

* * *

If anyone wishes to get into the production of magnesium, the War Assets Administration has a plant all ready to operate awaiting a buyer. About 60 miles southeast of San Francisco the plant, built by the government at a cost of more than $6 million for the production of magnesium by the ferrosilicon process and operated by The Permanente Metals Corp. during the war, lies dormant.

One of the first magnesium plants to be built in the hectic days after Pearl Harbor it soon reached capacity production by the expensive, but certain, ferrosilicon method. The ferrosilicon was produced in the furnaces of The Permanente Metals Corp. near San Jose and this was mixed into pellets with dolomite quarried nearby. Rated capacity of the plant is 10,800 tons of magnesium per year.

Located on a tract of 138 acres, the plant is in a fenced area of 26 acres. Machinery and equipment for magnesium production is complete in six principal and 11 smaller buildings. Two furnace buildings have a floor area of 258,832 sq ft; a foundry building contains 9954 sq ft; an office building has 5451 sq ft; and a mill building covers 4149 sq ft. A spur track of the Southern Pacific railroad serves the plant and dock facilities are available at Stockton 12 miles distant.

OAKLAND—Scrap dealers and buyers are generally hewing to the old OPA prices according to Philip Scheibner, owner of the Associated Iron & Metal Co., after a local checkup on his return from Washington, D. C., where he served on the Scrap Advisory Committee to the WAA.

Mr. Scheibner reported that he expects favorable results from the survey now being made for WAA in an effort to determine what materials should be flowing into the scrap market instead of possibly being used as usable material.

Establishes Silver Price

New York

• • • **In the absence** of OPA control, Handy and Harman has begun the importation and sale of silver at a price of 90.125¢ per oz. This price is sufficient to bring in shipments from Mexican producers who have been holding back in anticipation of a price rise since the end of the strike on April 15. This strike began at the end of the year and was a significant cause of the current world wide shortage of silver.

Meanwhile the House of Representatives has refused several times to approve the Post Office appropriation bill which carries the rider as to the increased prices of government silver reserves for sale to industry. The difficulty seems to have been not the proposed immediate price of 90.3¢ per lb, but the $1.29 price at the end of two years. Now it is understood that the House committee has removed the rider from the appropriation bill and will take steps to permit sale of treasury silver at a higher price without the provision of the escalator price clause. Meanwhile, the industry foresees that the Treasury silver may not be needed to meet domestic requirements at the present market price.

REPUBLIC Shankless* DRILLS

Drill More Holes... Cost 20% to 30% Less

The superior toughness of the Republic "Shankless" drill is explained by the fact that the grain of the steel follows the special direction of the flutes and lands of the drill, instead of being cut at spaced intervals, as in milled drills.

FORGED FOR EXTRA TOUGHNESS—Republic "Shankless" drills are made from bars rolled to a cross section closely resembling that of the finished drill. Then by roll forging, hot-twisting and press forging, the grain of the steel is made to flow into final drill form, curving with the flutes like the strands of a rope. This extra forging greatly increases the steel's toughness.

DESIGNED FOR EXTRA STRENGTH—All critical points of the "Shankless" drill are designed for extra strength. Drill necks are heat treated to provide cushioning action against shock. Finish grinding to very close tolerance and satisfactory concentricity equal to conventional drills is maintained at all times. Webs are uniformly heavy from point to neck.

7 DRIVERS FOR 135 SIZES—Republic "Shankless" drills are used with the Republic detachable Drill Drivers which will outlast many "Shankless" drills. Seven sizes of Drivers accommodate 135 drill sizes.

You will discover these points of superiority the first day you put Republic "Shankless" drills to work. They drill more holes, and cost 20 to 30% less, due to the simplicity of the manufacturing process and to the large saving in steel.

***Write for Booklet**—Write today for "Shankless" Manual S-4 for more details or let us send a Service Engineer to arrange a demonstration and test in your plant.*

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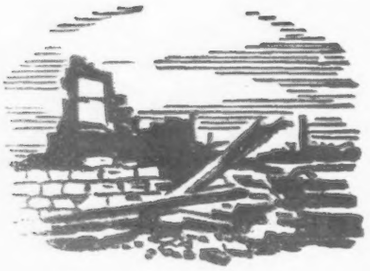
WORLD'S LARGEST EXCLUSIVE MANUFACTURER OF TWIST DRILLS

European Letter . . . .

JACK R. HIGHT

• Scotch shipbuilding industry suffering lack of ways . . . Steel price increases range up to 20 pct on cold-drawn tubes.



GLASGOW—The Shipbuilding industry, largest steel consumer in the district, is now booked up for from 3 to 5 yr of business, and is worrying more about the political future than about overseas competition or business slumps. Steel supplies are generally adequate for the present rate of production, with the principal limiting factor on construction being the space in the ways.

Most of the shipbuilding business at present is in combination cargo-passenger types, with Admiralty (Navy) building at a low ebb due to the war end and indecision in the government as to the future of navies in general. There was a quiet flurry of press guesses here when the *Vanguard*, Britain's latest heavy battleship, was launched to the effect that it might well be the last such vessel ever produced on the Clyde River, but there have been no official statements on the subject. Without a staff of efficient public relations men of the type used by the American Navy, the Admiralty here is more inclined to fight the future of the dreadnought out in private consultations than in press conferences.

To the first time visitor the amount of coastal and ferry building that goes on in the Clyde is surprising, bringing home with a strong impact the fact that this is indeed an island kingdom. Much of this shipping at present, up and down the coasts and across the channel belongs to the railway companies. These railways are going through a bad fit of the current plague over here, "nationalization jitters." It hasn't happened, but seems likely. The regrettable result of every such case of jitters that is worrying industries here is that all their suppliers worry right along with the principals.

This secondary backwash of nail-biting is at least partially justifiable in the case of the shipyards, as it directly affects their future planning. Most of the builders here like to have about 2 yr of business under contract for optimum planning. Some prefer to have slightly more. Further than that the amount of tonnage on the books is largely a matter of convenience. Although backlogs are heavy at the moment, many contracts for future tonnage are being delayed indefinitely because the railways are facing an uncertain future. They are no more anxious to gamble stockholders' money than are the steel companies who are worried about the terms of compensation for their plants.

THE present overloaded condition in the shipyards is somewhat deceiving as there is a considerable amount of refitting and remodeling of war transport vessels. This work is of an urgent nature, but is undertaken with some reluctance by the yards, as it results in difficult unbalance of employment. The refitting of a vessel does not employ all of the trades that are utilized to construct and fit a new ship. Thus, while there may be plenty of work for carpenters and some other trades on converting the Queen Mary and the Queen Elizabeth for luxury travel (the latter is in process now), they occupy valuable and limited way space which could be more economically used from the yards' standpoint in the construction of new vessels.

The system used for the refitting of the Queen Elizabeth was developed to limit this loss by sending her first to the Clyde yards for the essential work that could not be done elsewhere. After this work was completed she was sent to Southampton, where she is now tied up while the refitting is going on. This required a minor migration of skilled shipworkers from their Scots homes to the South Coast, but was considered to be worth the effort.

There is an additional limit on the amount of work being done in the shipyards imposed by the shortage of skilled labor. This is an anomaly of the United Kingdom economy as Scotland, which in the prewar period was one of the worst "pockets" of unemployment, even today is reported as having a substantial number of unemployed. There is some difference of opinion as to whether this is a genuine or artificial situation today, but at least the shipyard operators insist that there is a shortage of skilled men. There are definitely a large number of men who are still enjoying their terminal leaves from the armed forces and have not yet gone to work, but no one is willing to guess how this may affect the supply of shipyard labor. During the war period labor was so short that even the most important yards only worked a single shift.

BITTEREST pill that the British have swallowed since my arrival went down with audible gulpings recently. The announcement of bread rationing was not without warning, it had been predicted for weeks, and the government was as forthright as it could be in laying the wheat situation bare to the people.

I was visiting the shipyards when the blow was announced, and traveled by rail through Scotland the day afterward. While the British people are fond of grumbling about the diet, with adequate cause, and there were solemn warnings that bread rationing would not and should not be acceptable, the new order advanced on the public without disorder.

As far as the ration itself goes, the government's statistical whizzes show that 9 oz of bread per day is more than the national average consumption at present. The avow-

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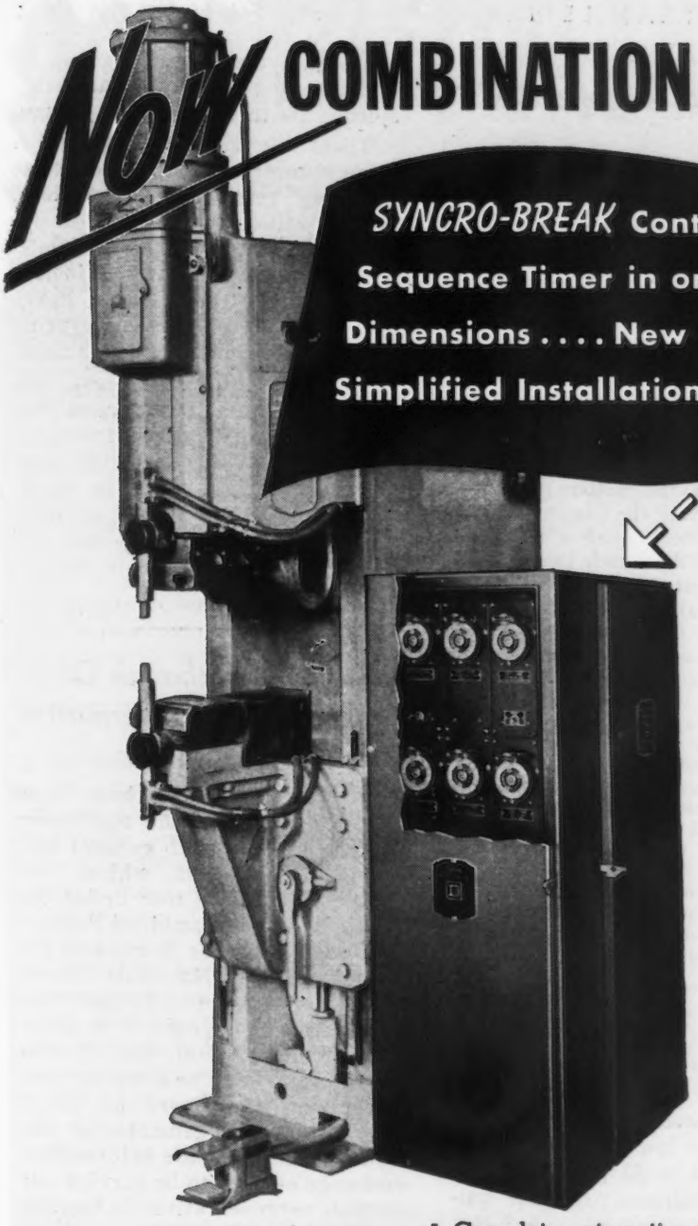
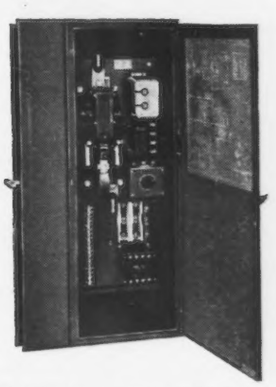
SYNCRO-BREAK Contactor and *Safront* Weld Sequence Timer in one enclosure .... Standardized Dimensions .... New Safety Features .... Greatly Simplified Installation .... Improved Appearance



1. Complete automatic control system in one cabinet—necessary control fuses, terminals, transformers, etc. included.
2. Specifically designed to meet new standards and recommendations of RWMA and machinery builders.
3. Front location puts dials within easy reach to facilitate machine set-up or time adjustments.
4. Depth standardized at 20 inches, width kept within 15 inch maximum.
5. Foot switch, pressure switch, no-weld switch and timer control circuits are 110 volts for added operator safety.
6. Panel space provided for low voltage control or two-position foot switch auxiliaries.

Safront panel swung out to show timing and sequencing relays. Adjusting dials are on front of this panel for maximum safety. Separable connector strip allows easy removal of panel for installation or maintenance.



Side door gives access to contactor, control fuses, and all line, load, and control terminals. *SYNCRO-BREAK* rheostat is mounted on extended bracket to bring adjusting knob out beyond live parts.

for complete information, **write Square D Company, 4041 N. Richards Street, Milwaukee 12, Wisconsin**

SQUARE D COMPANY

DETROIT • MILWAUKEE • LOS ANGELES

ed intention is to save wheat by cutting down on the amount of flour sold, and in the consumption of cakes and pastries. Thus the end result may be that more bread is available, and the lower income groups may so benefit. On the other hand bread tends to be a more important part of the diet for these people—so their benefit may be actually a hardship.

Press accounts of rioting in America and bread going "under the counter" were played up to help justify the move, and the Minister of Food respectfully declined from guessing when bread rationing might end. The rationing technique itself is as detailed and foolproof as the British civil servants can make it, and fits in with the other rationing plans to give more of other foods to persons who eat less bread.

As far as my own diet is concerned, I expect that the new order will mean that I shall eat more bread than I ever have. I am sure that I have not been consuming 9 oz per day, but the temptation to consume as much as possible of everything that is rationed is almost overpowering. While the meat ration is very small, and is missed by a new arrival from America, I have found myself eating cheese and margarine and butter in unnecessary quantities just to get my due.

Unfortunately, those Britons who do not go jaunting to the Continent periodically have to make their rations stretch a little further, so I probably am unusual in this respect. For the first few weeks after my arrival in England I suffered a fearful guilt complex because I frankly had not contemplated the true extent of shortages here. I have felt slightly better since visiting France and Belgium however, as I now know that the British people in their turn are just as uninformed about how much worse conditions are on the Continent as Americans in general are about conditions in England and on the Continent.

LONDON—A new price schedule issued by the Ministry of Supply Iron & Steel Control effective July 1 carries substantial price increases on Staffordshire pig iron, galvanized sheets, some wire products, cold-drawn steel tubes, soil pipe and steel castings. Wire mesh is freed from control, and the maximum prices for finish machined forgings are withdrawn.

The increase on Staffordshire blast furnace low phosphorus pig iron amounts to $3 per ton, while the legal maximum price for galvanized sheets thinner than 3 mm goes up by $3.20 per ton. In addition a $12 per ton increase was made in the regular extra for galvanizing commercial hot-finished tubes.

Increases amounting to about 20 pct become effective on the following products: Cold-drawn mechanical tubes, cold-drawn boiler tubes, Admiralty cold-drawn mechanical tubes, aircraft steel tubing, aircraft stainless steel tubes, 12 pct Cr stainless steel tubes, Austenitic Cr Ni steel tubing, Austenitic Cr Ni steel tubes for welding, cold-drawn tubes to Admiralty specifications.

Prices on cast iron drain pipes, fittings and angle cast pipes for gas and water purposes; and railway coil springs go up by 5 pct. The ceiling prices for wire haulage ropes and steel castings go up by 6 pct, and railway laminated springs are increased by $3 per ton.

There are also increases on a large number of established extras including rerolled bars, sections, and hot-rolled strip, alloy steel billets and bars, ternes and blackplate. A list of new extras is also included, with tube steel billets, heavy bars, sections and plates figuring in the establishment of new extras.

The best information available here at the present indicates that generally export prices from the U.K. are averaging about the same as domestic prices, with the exception of sheets. Most sheet products are selling at about $8 per ton above domestic ceilings in the export market.

Kaiser Gets Light Car

Paris

• • • **French reports indicate that American licenses for the 800-lb cast aluminum alloy passenger car have been granted Kaiser-Frazer. British Empire rights for the production of this car have already been granted to Grantham Productions Ltd., and production will be under the name "Kendall-Gregoire."**

The latter name is that of the French design engineer from the polytechnic school of Paris who laid down the pattern of the vehicle during the German occupation. The French aluminum company aided him in the design and exhibited certain of the castings at the recent Paris Fair. The first British production is now getting under way with Renfrew Foundries Ltd. doing the casting. The British licensees also are making detailed plans for factories in Canada and India.

Gas consumption is stated to be more than 50 miles to the gallon, and the car is said to be capable of 60 mph. The French producers Simca and Panhard-Levassor companies also plan to produce the Gregoire car, but actual production dates are as yet undecided.

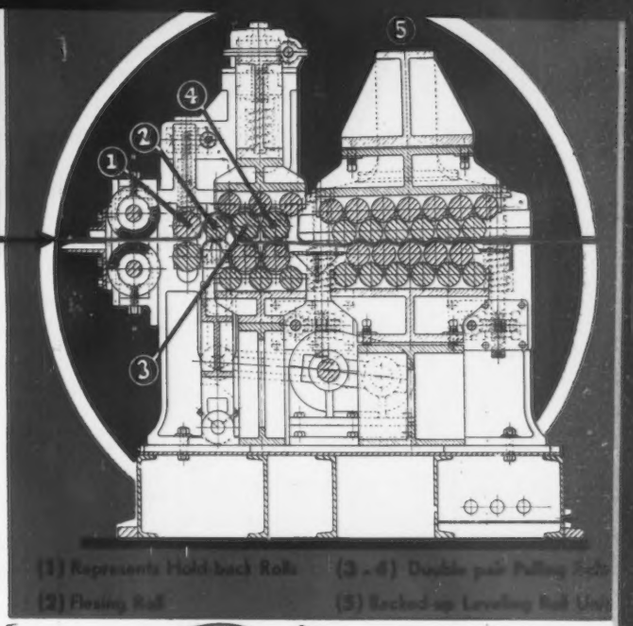
Continues Exchange Of Economic Information

Washington

• • • **Arrangements have** been made to continue the machinery for the exchange of general economic information which was set up during the war under the authority of the Combined Production and Resources Board and the Combined Raw Materials Board, it has been announced by the Office of International Trade, U. S. Dept. of Commerce, and the British Board of Trade. The Dept. of Commerce and the Board of Trade have made arrangements for the work of the economic information exchange service to be carried out by their representatives in London and Washington.

Arthur Paul, assistant to the secretary of commerce and OIT director, pointed out that the department had already initiated discussions with other countries looking toward the establishment of similar arrangements for exchange of economic information. Mr. Paul and Dr. Philip M. Hauser, assistant director of the Bureau of Census and assistant to the secretary of commerce, concluded the negotiations with the Board of Trade on their recent trip to Europe. They also held preliminary discussions along similar lines with officials concerned with trade statistics in France, Czechoslovakia, and Poland. It is planned to hold similar discussions with representatives of other countries at an early date.

BUDD-McKAY



(1) Represents Hold-back Rolls (3 - 4) Double pair Pulling Rolls
(2) Flexing Roll (5) Backed-up Leveling Roll Unit

IN operation, a sheet is fed between the brush rolls, the hold-back rolls and into the bite of the pulling rolls which draw it into the machine. After the sheet is securely gripped by the pulling rolls, the flexing roll is automatically shifted from its idle position below the pass line into its upper, or working, position as indicated by (2). This causes the sheet to go into a full quarter turn around the exit side of the hold-back rolls (1), a reverse half-turn upward over the flexing roll (2), and another reverse quarter turn downward around the first top pulling roll (3).

The triple bending, or flexing, of the sheet as it passes in and out of the loop kneads the steel and imparts the desired amount of cold plasticity. A second set of pulling rolls (4) directs the sheet into the backed-up leveling rolls where it is flexed repeatedly and finally ejected a flat sheet.

The progressive advancement of the bend throughout the area of the sheet, followed by a pass through the staggered leveler rolls, permits the flexing to be carried much further beyond the elastic limit of the steel than is possible by any roller leveler, thus affording greater freedom from stretcher strains.

While conventional four-high roller leveling machines assist fabricators in securing a suitable texture in steel sheets, yet the mechanical work accomplished is not sufficient to make the sheet altogether immune from surface blemishes. The flexing action of the BUDD-McKAY PROCESSOR frees the grain structure so that, when the steel is drawn under dies to the desired contour, stretcher strains do not occur.

Sheets processed by the BUDD-McKAY PROCESSOR remain free from strains longer because of the extreme flexing and thorough roller leveling, but subsequent forming operations should follow soon after the processing if its full benefits are to be obtained, as a lapse of time causes the sheet to display a tendency to return to its initial condition.

Sheet PROCESSING MACHINE

WITH THE NEW BUDD-McKAY SHEET PROCESSING MACHINE it is possible to render sheets free of stretcher strains. Sheets processed on this patented processing machine have far superior stamping and drawing qualities, and retain these qualities much longer, than sheets processed by any other method.

BUDD-McKAY (PATENTED) PROCESSOR

THE McKAY MACHINE CO
ENGINEERS AND MANUFACTURERS OF SHEET, TIN AND STRIP MILL EQUIPMENT
YOUNGSTOWN, OHIO
ASSOCIATED COMPANY

THE WEAN ENGINEERING CO., Inc. • Warren, Ohio

PERSONALS

o o o

• **W. I. Manley** and **Barney D. McCarthy** have been appointed assistant district managers of Republic Steel Corp., Youngstown, Ohio. Mr. Manley takes charge of the Bessemer converter plant, rolling mills, pipe mills and the service dept. He has been superintendent of the mechanical dept. since 1936 and has been employed by Republic since 1915. Mr. McCarthy has charge of the coke plant, blast furnaces and the openhearth furnaces. He was formerly superintendent of openhearth furnaces in the Youngstown district.

• **Raymond H. Romig** has been appointed district manager in Washington for the Midvale Co., to succeed **Herbert H. Moffitt,** who has retired after many years of service.

• **Joseph E. Workman,** Chicago district manager for Latrobe Electric Steel Co., Latrobe, Pa., has been appointed assistant sales manager, effective Aug. 1. Mr. Workman was employed by Logan Gear Co. before coming with Latrobe. He served in Latrobe Electric's Toledo branch prior to being made manager of the Chicago branch. **Robert F. Frazure,** Toledo manager, succeeds Mr. Workman as Chicago district manager. **Ralph H. Bailey,** Dayton manager, becomes district manager of the Toledo office.

• **R. W. Mason, Jr.,** formerly associated with the Lithium Co., has joined the Development & Research Div. of the International Nickel Co., Inc. He will serve in the Detroit office as metallurgist and consultant to consumers and producers on the use of nickel in ferrous and nonferrous castings.

• **Milan J. Siebert** and **Kenneth J. Humberstone** have been named vice-president and chief engineer-chief metallurgist in charge of Amera-Mag metallurgy and engineering, of the American Tank & Fabricating Co., Cleveland. Mr. Siebert will also serve on the board of directors.

• **N. H. Critton,** formerly district manager in Newark, N. J., for the Monarch Machine Tool Co., has been made eastern sales manager with headquarters in New York. **F. J. Griffis** of Monarch's eastern sales staff becomes district manager in Newark.

• **Harold J. Ruttenberg,** research director of the United Steelworkers of America CIO since 1936, has been appointed vice-president of Portsmouth Steel Corp., Portsmouth, Ohio. Mr. Ruttenberg served as assistant director of the War Production Board's Steel Div. during the war, and was a member of the steel commission of the War Labor Board.

C. R. HARMON, general sales manager, Penn Carbide & Alloy Casting Co.

• **C. R. Harmon** has been named general sales manager of the Penn Carbide & Alloy Casting Co., Canonsburg, Pa. Mr. Harmon was formerly manager of specialty sales for the Jessop Steel Co.

• **Buckley M. Byers** has been appointed assistant manager of the New York office of A. M. Byers Co., Pittsburgh. He will be in charge of export sales.

• **George T. Jahnke** has been appointed director of advertising of the Liquid Carbonic Corp., Chicago. Mr. Jahnke was in charge of Liquid's advertising from 1919 until shortly after the outbreak of World War II. Then he organized a division to expedite materials and parts for war contracts and headed that department for more than 3 yr. In March of 1944 he resumed his advertising duties.

• **R. C. Garlick** has been named assistant sales vice-president and **G. Finely Griffiths,** general sales manager of Sharon Steel Corp., Sharon, Pa. Mr. Garlick joined the company in 1909 as a salesman. In 1940 he became general sales manager. Mr. Griffiths became associated with Sharon Steel in 1938 as a salesman in the Chicago office, having previously been with the U. S. Steel Products Co. He was promoted to district sales manager of the Chicago area to succeed Mr. Garlick in 1940.

• **Glenn A. Hutt,** formerly assistant general sales manager of Ferro Enamel Corp., Cleveland, and its divisions, has been promoted to the position of general sales manager. **John R. Kauffman,** recently returned from the U. S. Navy, has been named eastern sales manager, Allied Engineering Div., Ferro Enamel Corp., with his offices in New York.

• **Charles F. Harding** has been appointed head of the St. Louis scrap dept. of Hickman, Williams & Co., filling the vacancy caused by **Harry J. Kiener's** retirement. Mr. Harding has been Mr. Kiener's assistant for the past 15 yr.

• **Davis L. James, Jr.** has joined Taylor-Wharton Iron & Steel Co. as industrial engineer for the High Bridge, N. J. and Easton, Pa. plants. During the past 5 yr he has been industrial engineer for Crucible Steel Co. of America.

• **Kenneth H. Barnes** has been appointed chief engineer of American Foundry Equipment Co., Mishawaka, Ind. He has been with the company for 10 yr, and for the last 5 yr has been in the sales dept. where he held the position of assistant sales manager. **Chalmer R. Cline** has been appointed engineering assistant to the president. His former business connections have been with Commercial Steel Castings Corp., National Steel & Tube, Thew Shovel Co., American Gas Assn., and American Mfg. Co. **Sherrill S. Deputy** has joined American Foundry Equipment Co. as assistant sales manager after an 18 yr association with International Business Machines, Inc.

• **Ed G. Doran** has been appointed sales representative in Chicago and northern Illinois for Michigan Broach Co. of Detroit.

JOSEPH N. PETERS, manager, Carbide & Cast Alloy Div., Jessop Steel Co.

• **Joseph N. Peters** has been named manager of the Carbide & Cast Alloy Div. of the Jessop Steel Co., Washington, Pa. He first joined the company in September 1945, having been previously employed successively by the Callite Tungsten Products Corp., Allegheny-Ludlum Steel Corp. and the Universal Cyclops Corp.

• **Walter Ernst,** former zone manager of the Hudson Sales Corp., has been named divisional sales manager of the southeast division, with headquarters in Washington.

• **H. F. Brown,** formerly works manager of Boeing's Wichita division, has been named vice-president in charge of production manufacturing of the Boeing Aircraft Co. at Seattle. He joined Boeing 15 yr ago as chief draftsman. **F. P. Laudan,** vice-president, has taken charge of the company's experimental manufacturing. He was in charge of the Boeing-Renton operation during the war. **H. O. West** has resigned as executive vice-president of the company. Connected with the aviation industry since 1921, he has been active with United Air Lines and Trans-Canada Air Lines as well as with Boeing. **A. W. Schupp,** for several years assistant works manager, has been named works manager of Boeing's Wichita division. **H. E. Schaefer,** vice-president, is general manager of the Kansas plant.

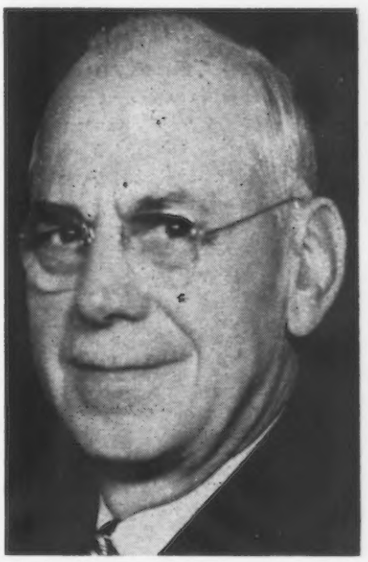
• **Carl W. Huflage** has returned to the Reynolds Metals Co., Foil Div., Richmond, Va., as manager of converter sales, after more than 3 yr service in the U. S. Navy. Mr. Huflage joined Reynolds in 1926 and served in various capacities in sales offices. At the time he left Reynolds on leave of absence he was manager of the Southern Sales Div. **Charles Tichy,** plant manager of the Reynolds Metals Co. Louisville extrusion plant, has been appointed to take charge of the Phoenix, Ariz. extrusion plant leased from the government on a 5-yr contract. **William F. Hunt,** who has served under Mr. Tichy as chief engineer of the Louisville extrusion operations, occupies the same position in Phoenix. Extrusion operations in Louisville are handled by **Harry D. Bitner,** formerly assistant plant manager, who will assume the title and responsibilities formerly held by Mr. Tichy.

• **Frank A. Demms** has retired as a director and treasurer of the Shenango Furnace Co., and Shenango-Penn Mold Co., after more than 40 yr association with the W. P. Snyder interests in Pittsburgh. Mr. Demms has been in charge of the financial depts. of these companies, and will be succeeded as treasurer of the two companies by **John K. Foster.**

• **Ralph W. Cook** has been appointed sales manager for Food Machinery Corp.'s Bean-Cutler Div. at San Jose, Calif., succeeding W. E. Abildgaard. Mr. Cook's initial experience with the company began with the Peerless Pump Div. at Los Angeles.

• **Noel B. McLean** has been appointed executive vice-president of Edo Aircraft Corp., of College Point, Long Island, N. Y. Mr. McLean comes to Edo from Bendix Aviation Corp., where he was general manager of the Marine Div. factory at Norwood, Mass. Before that he was general manager of Bendix Philadelphia Div. plant.

• **John E. Andress** has retired from active responsibility in the management of the Barnes Drill Co., Rockford, Ill., but will continue as chairman of its board of directors.



GEORGE A. LENNOX, vice-president in charge of sales, Driver-Harris Co.

• **George A. Lennox** has been appointed vice-president in charge of sales and **Joseph B. Shelby,** assistant vice-president in the same department of Driver-Harris Co., Harrison, N. J. Mr. Lennox has been associated with the company since 1907 and was appointed general sales manager in 1942. Mr. Shelby's connection with the company dates back to 1919. He was appointed assistant general sales manager in 1942.

• **Harry L. Crawford and William M. Mazer** have been appointed district representatives of the Empire Steel Corp. for the state of Michigan with offices in Detroit.

• **Justin J. Wetzler** has been appointed director of engineering, and **J. Harvey Chandler,** chief engineer of Barnes & Reinecke, Chicago. In the newly created position of director of engineering, Mr. Wetzler supervises engineering design and coordinates the work of the engineering dept. and machine shop. He was formerly the company's chief engineer. Mr. Chandler, who as chief engineer supervises production in the engineering dept. and machine shop, was formerly with the Ekco Products Co.

• **Prentiss S. Hughel** has been appointed superintendent telegraph, New York Central Railroad, with headquarters at Detroit. He succeeds **C. E. Baxter,** who died recently.

• **W. D. Bickel** has been named manager of the power dept. of the Machinery Div.; **T. L. Hartman,** manager of the piping dept. of the Machinery Div.; and **W. G. Greer.** assistant labor relations manager of Dravo Corp., Pittsburgh. Mr. Bickel was formerly a project engineer for the power dept. He assumes duties vacated by W. P. Berg. Mr. Hartman came to Dravo Corp. in 1937 and has been associated with the power dept. since that time. Mr. Greer began work with Dravo on the Kanawha River Lock project in 1932 and has been active in many large construction jobs with the Contracting Div.

• **Stanley S. Furst** has been named general sales manager and **James P. Raugh,** general works manager of General Refractories Co., Philadelphia. Both Mr. Furst and Mr. Raugh joined the company 18 yr ago and both recently returned from duty with the armed services.

• **Arthur W. Coppin** has been elected secretary of Foote Bros. Gear & Machine Corp., Chicago, succeeding **J. R. Fagan,** formerly secretary and treasurer, who has become senior vice-president and treasurer. **Fred Salzmann** has been appointed assistant vice-president. Mr. Coppin was formerly counsel and manager of industrial relations. Mr. Salzmann has been with the company for more than 20 yr in a variety of production and engineering capacities.

• **William M. Springer** has been appointed X ray products manager in the E. I. du Pont de Nemours & Co.'s photo products dept., taking the place of **Cyrus A. Poole,** who has been transferred to the Sales Research Div. Previously Mr. Springer was technical representative in western New York and later in Massachusetts.

• **Richard P. Seelig,** who for 8½ yr was identified with Powder Metallurgy Corp. in Long Island City, N. Y., has joined the staff of the American Electro Metal Corp. in Yonkers, N. Y. He will be principally concerned with engineering and tooling for production work, and engineering developments on new processes.

• **George E. Stoll** has been promoted to general manager of the Products Div. of Bendix Aviation Corp., Detroit.

EMERSON H. TODD, sales manager, American Cable & Hazard Wire Rope Divs., American Chain & Cable Co., Inc.

•**Emerson H. Todd** has been appointed sales manager of American Cable & Hazard Wire Rope Divs. of American Chain & Cable Co., Inc., succeeding **Frank W. Bemis,** who has resigned. Mr. Todd will make his headquarters at Wilkes-Barre, Pa. He has been with the company since 1925, and for the past several years he has been Chicago district sales manager for the American Cable & Hazard Wire Rope Divs. **George Gunther,** who has been with the company prior to his service with the armed forces, has been appointed Chicago district manager for the wire rope divisions succeeding Emerson Todd. Mr. Gunther's headquarters will be at Chicago.

• **Philip H. Bills,** vice-president since 1932, has been made executive vice-president of the Gilbert & Barker Mfg. Co., Springfield, Mass. Mr. Bills joined the firm in 1912 as a member of the accounting dept.

• **J. D. Hamacher** has been made plant engineer of Detrex Corp., Detroit. He joined Detrex in 1944 and has been employed as design engineer in the Oil Extraction Div.

•**J. B. Trotman** has been appointed head of the new Bowser, Inc. Industrial Pump Div., Fort Wayne, Ind. He has been for the past 6 yr general sales manager of Blackmer Pump Co., Grand Rapids.

• **M. C. Ness** has been appointed assistant general purchasing agent of American Chain & Cable Co., Inc., with headquarters at Bridgeport, Conn. Mr. Ness has been with the company for 26 yr, and he has been purchasing agent for the York, Pa. plants. **W. E. Speck,** who has been in the York, Pa. purchase dept., has been appointed purchasing agent for the plants in that city.

• **Frank Breckenridge** has been appointed vice-president and chief engineer of the Automatic Washer Co., Newton, Iowa. He was formerly with the International Telephone & Telegraph Corp., and prior to that was section manager of the appliance engineering dept. of Westinghouse Electric Corp.

• **F. F. Simon** has been named vice-president and controller of the Wagner Electric Corp., St. Louis. **G. A. Waters** has been appointed vice-president in charge of manufacturing; and **K. M. Coggeshall,** assistant vice-president in charge of production and purchasing. Mr. Simon has been connected with the Wagner Corp. since 1917 and has been controller since 1934. Mr. Waters started with the company as a student engineer and subsequently advanced to the position of chief engineer. Mr. Coggeshall also began as a student engineer, and after advancing through a number of divisions, he became production manager in 1926.

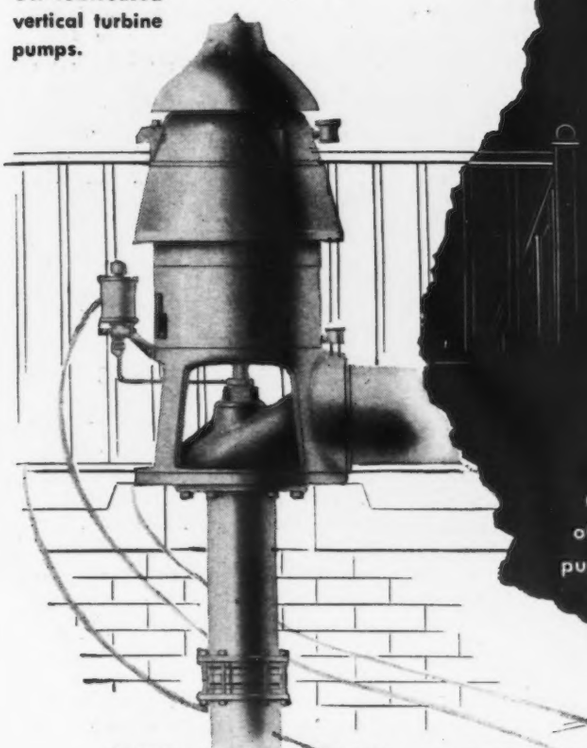
OBITUARY...

• **Joseph E. Dulaney** and **Virginius W. Moody, Jr.,** respectively assistant vice-president and assistant manufacturing director of the Reynolds Metals Co., Foil Div., Richmond, Va., were killed June 29 when they were struck by lightning while playing golf.

• **Paul E. Booth,** 46, partner of the Oatis-Booth Machinery Co., died June 30 at Indianapolis.

• **Herman E. Heine,** 76, former plant superintendent and one of the founders of the Bradley Washfountain Co., Milwaukee, died recently.

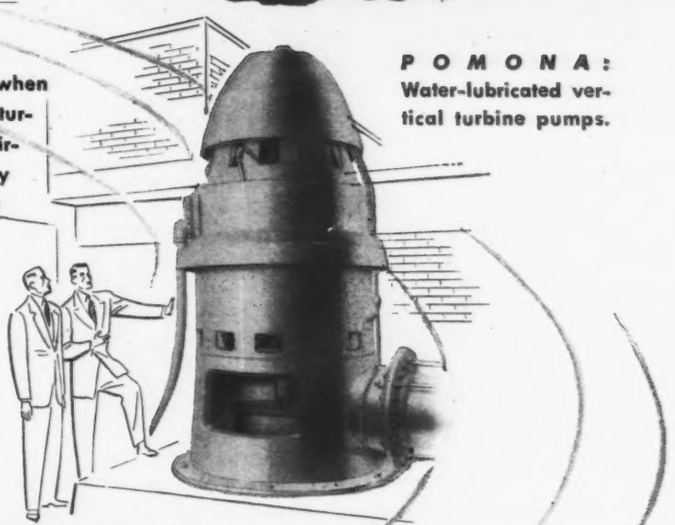
FAIRBANKS-MORSE: Oil-lubricated vertical turbine pumps.

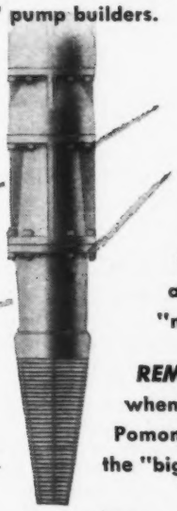


After all, what is the best way to tell a good pump? While you can compare efficiency curves, high efficiency in the test-room is no assurance of stamina on the job. Nor can performance data prove that you're getting the pump that's best for your specific liquid-moving work. *The name alone tells this story!*

Who makes it? On a good pump the name plate symbolizes manufacturing facilities, years of research and testing, trained men and intimate knowledge of all pumping requirements that back an ability to pump for you for less, through the years.

POMONA: Water-lubricated vertical turbine pumps.





THERE'S NO GUESSWORK required when it comes to choosing the best vertical turbine pump for you. For the names of Fairbanks-Morse and Pomona identify every type and size of vertical turbine found in industry today; and these names stand unique in the pump-building world as two of the oldest, most widely respected and "depended upon" pump builders.

GOOD PUMPS? Yes, and there are many who know these as *the best* of the vertical turbines—thousands and thousands of users who consistently report "maintenance costs nil, power costs extremely low."

REMEMBER THESE NAMES and all that is behind them when faced with a pumping problem. Then see your Pomona dealer or visit your Fairbanks-Morse branch office—the "big store" for all *good* pumps.

FAIRBANKS-MORSE

A name worth remembering

DIESEL LOCOMOTIVES • DIESEL ENGINES • MAGNETOS • GENERATORS • MOTORS • PUMPS
SCALES • STOKERS • RAILROAD MOTOR CARS and STANDPIPES • FARM EQUIPMENT

Dear Editor:

NEW SCRAP SOURCE

Sir:

I have read in a late news dispatch your report on the operation of the steel industry in which you describe the serious shortage of steel and scrap iron. I am a seaman since boyhood and have completed plans of a revolutionary sea derrick that can lift 10,000 tons or more or any size ship that can be found on the ocean bottom whereas the greatest sea derrick today can lift only less than 300 tons.

One of the sea admirals reported some time ago that more than 90 ships were sunk during the war along the east coast of the United States and 40 of these ships were sunk outside Florida and New Orleans, so this provides quite a field for scrap steel production.

Since you, sir, are so well acquainted with concerns engaged in the production of steel, would you be so kind as to direct me to a large concern of this class or anyone else who might be interested and who would be willing to buy scrap iron and steel in 1000-ton lots or more.

L. A. MIKKALSEN
Captain
Perth Amboy, N. J.

VICALLOY

Sir:

We would like to obtain additional information concerning Vicalloy, which was described in "Newsfront" of the Mar. 7 issue.

R. L. HARTWELL
Executive Vice-President
Metal Textile Corp.
Orange, N. J.

● Vicalloy is a machinable permanent magnet steel developed by Bell Telephone Laboratories, 463 West St., New York. A comparison of the electrical characteristics of this material with other magnet steels is contained in the article "Permanent Magnet Steels," published in the issue of May 9.—Ed.

MAGNESIUM CASTINGS

Sir:

We would appreciate a reprint of the article "Impregnating Magnesium Castings," which appeared in the Mar. 14 issue. . . .

J. J. O'CONNELL
Shell Chemical Corp.
San Francisco

● We are forwarding you tear sheets of the article. Additional copies in the form of reprints are available from the Interchemical Corp., 350 5th Ave., New York. —Ed.

INTERNATIONAL OPERATION

Sir:

In response to your appeal in the issue of May 9 (Dear Editor, p. 108) we have the pleasure of sending you herewith a negative photostat of the article by Stetser and Norton, "Combustion Train for Carbon Determination." Unfortunately, we cannot confirm the original source of this paper as our copy is a reprint which does not quote the source, but we feel sure it is the paper wanted by your French correspondent. The reference quoted in Mr. Lauret's letter probably should have read "vol. 102, 443, 1918." We are glad to be able to offer you this quid pro quo for the several acts of kindness you have extended us in the past.

E. A. WOODWARD
Research Dept. Library
Hadfields, Ltd.
Hecla Works
Sheffield, England

● We are indebted to you, reader Woodward, for your kindness. The photostats have been forwarded to France. The elephant-like memory of our subscribers is constantly startling us. Several readers (Dear Editor, p. 82, May 30 issue) have earlier pointed out the proper volume number. Now our English subscriber provides us with photostats of the article, long out of print, for a reader in France. The era of international cooperation has arrived, at least on the industrial plane, if not the political.—Ed.

SURPLUS MACHINE TOOLS

Sir:

We note in your publication that there is available a booklet "How to Buy Surplus Machine Tools." We also note that it is published by the National Machine Tool Builders' Assn. Would you please furnish us with the address of this association so that we may obtain this booklet?

A. C. MURPHY
Continental Machinery Co.
Pittsburgh

● The address of the NMTBA is 10525 Carnegie Ave., Cleveland.—Ed.

PAGE THE INDIANS

Sir:

We are writing to ask if we may have permission to reprint the editorial "Page the Indians" by Mr. Van Deventer, which appeared in the June 13 issue, in our monthly employee publication. . . .

W. J. STEWART
Advertising Manager
Cleveland Punch & Shear Works Co.
Cleveland

● You have our permission.—Ed.

STRESSCOAT

Sir:

Referring to the article "Electric Strain Gages Aid Machine Design," published in the issue of Apr. 11, we would like to know where we may obtain further information on Stresscoat procedure and the lacquer used to spray on steel construction.

LE DIRECTEUR GENERAL
Usines Emile Henricot,
Court-Saint-Etienne,
Belgium

● Information on Stresscoat procedure may be obtained from Magnaflux Corp., 5900 Northwest Highway, Chicago.—Ed.

CENTRIFUGAL CASTINGS

Sir:

We are interested in the following article mentioned on p. 235 of the American Society of Metals Review 1944, vol. 1. "High-Strength Centrifugal Castings," by Stanley P. Perry, Oct. 5, 1944 issue, pp. 52-53. We would appreciate copies of this article if you can furnish them.

N. SAINDERICHIN
Delegue de la Division "Energie"
Republique Francaise
New York 6

● We are forwarding you copies of this article with our compliments.—Ed.

METRIC V. ENGLISH SYSTEM

Sir:

We are interested in Mr. C. C. Finn's presentation of the case against the adoption of the metric system in this country (Dear Editor, p. 94, June 27 issue) and would appreciate receiving a copy of this statement, if it is still available.

H. L. KUHN
Bakelite Corp.
Bloomfield, N. J.

Sir:

Please send the writer a copy of the 10-page statement by C. C. Finn referred to in "Dear Editor," June 27 issue.

N. MONSARRAT
Chief Engineer
Pantex Mfg. Corp.
Pawtucket, R. I.

● Apparently there is still a very live interest in the question of metric v. English system of weights and measurements, judging by the comments on Mr. Finn's letter. It has been necessary to have another set of copies made of Mr. Finn's 10-page case against adoption of the metric system to take care of requests. We have a few copies left which are available, gratis, to interested subscribers.—Ed.

BABBITTING BEARING SHELLS

Sir:

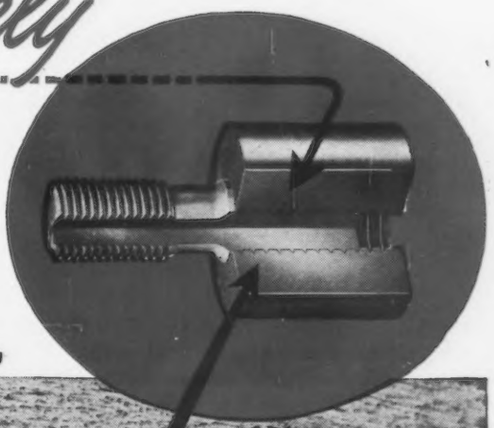
Please send me tear sheets of the article "Babbitting Large Cast-Iron Bearing Shells" which appeared in your Apr. 4 issue.

J. H. BUERGER
Special Products Representative
U. S. Pipe & Foundry Co.
Burlington, N. J.

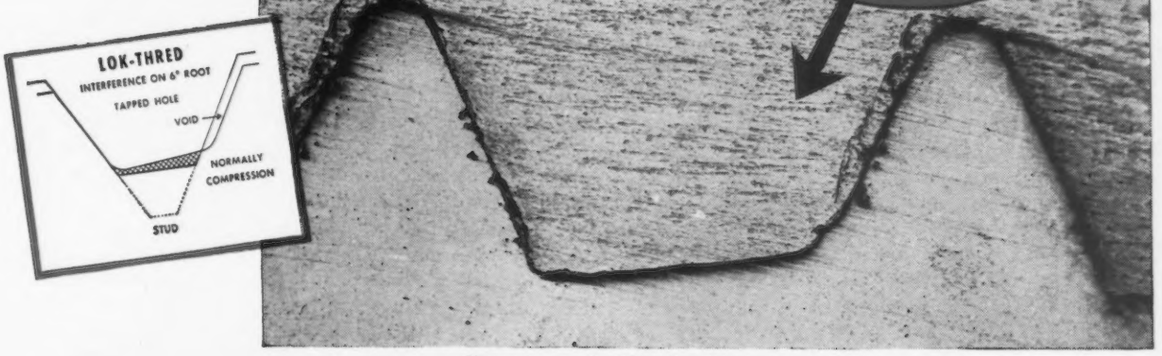
THIS STUD *locks securely*

IT'S THE NEW LOK-THRED

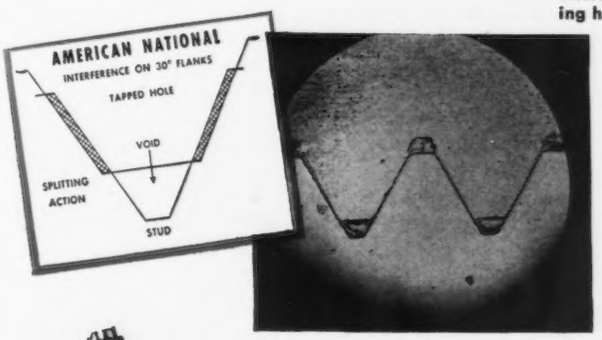
MADE BY "NATIONAL"



Patent Pending



Photomicrograph of thread section in place in aluminum, showing how 6° root angle in Lok-Thred design absorbs the load.



Photomicrograph of conventional stud thread (oversize fit in an attempt to lock).

Here's an entirely new principle of thread design—the LOK-THRED!

In conventional threads, stresses result in shearing or stripping action borne by the thread flanks.

The LOK-THRED design puts the load on the 6° angle at the root of the thread so that stresses are carried by compression transmitted to the surrounding metal.

The LOK-THRED is especially suited to studs for use in aluminum and magnesium as well as cast iron or steel. It solves the designer's age-old headache of studs loosening under vibration or lateral motion.

FACTS ABOUT LOK-THRED

1. A modified American National thread designed to lock securely and become tighter in service.
2. Handled with standard tools.
3. Does not require selective fits.
4. Seals positively and in many cases obviates need for blind tapping and adding bosses.
5. Has much higher fatigue limit than ordinary threads.
6. Does not gall when being driven.
7. Does not fret from lateral motion.
8. Entire normal working load carried on 6° angle at root of thread.
9. Stronger in both tension and torsion than ordinary American National threads.
10. Re-usable and on any re-application one additional quarter turn brings the torque back to its original installation value.

Write for samples and full information

National HEADED AND THREADED PRODUCTS

THE NATIONAL SCREW & MFG. CO., CLEVELAND 4, O.

This Industrial Week . . .

- **Present Status Pseudo Free Markets**
- **Clarification on Steel Prices Seen**
- **Steel Rate Rises ½ Point to 89 Pct**

THE current situation in steel markets and in the iron and steel scrap field is that of a pseudo free market. While price controls have been off for more than two weeks, steelmakers and most scrap brokers and dealers have refrained from taking any important price action.

This attitude was based on the fact that it was unknown what trend price control legislation would take and the possibility that any unseemly rises might have contributed to the passage of strict price control. Practically all steelmakers have been and are against the return of rigid price control and they favor a free market where proper costs can be balanced out with price increases which they claim would be based on a fair profit pattern.

So far in the steel and scrap industries the "Hold the Line" tactics have been substantially successful. To think that this state of suspended animation in price action will continue if OPA dies permanently and price legislation is abandoned, is completely to ignore the past history of steel and scrap prices.

The basic fear in the steel industry which firmly believes higher prices are warranted to take care of past increased costs is that once price controls are eliminated iron and steel scrap will reflect the full play of a free market and soar to much higher price levels. In the period before controls were slapped on price quotations, the price of No. 1 heavy melting steel at Pittsburgh rose rapidly to $26 or more a ton and would have advanced farther had it not been for the freezing action.

NOW steel firms are fearful that history will repeat itself and that scrap prices may soar much higher than before the war in view of the dissipation of scrap supplies during wartime operations. A sharp rise in the price of scrap, coupled with certain advances in other raw materials, would put steel companies far behind in the relationship of their prices to costs. To compensate for such a situation, steel firms would be forced to make substantial advances on practically all steel products.

Steel scrap movements today are primarily shipments on old contracts and few new orders have been taken during the past few weeks. Some large scrap brokers and dealers have sold tonnages at old OPA ceilings in an effort to retain trade relationships with their customers. Steel companies, on the other hand, have not only been reluctant but have refused to place new business at any price level above the old OPA ceiling.

The only exceptions to this general state of affairs have been isolated cases in the sale of cast iron scrap for foundry or steel mill use which reflected sales ranging from $5 to $10 a ton above the old OPA ceiling. By and large the scrap picture reflects a waiting game on the part of not only scrap dealers and brokers but manufacturers holding scrap supplies as well.

STEEL consumers whose operations generate scrap as a byproduct have been just as anxious to know the future of the price control trend as have been dealers and brokers in the scrap trade. These sources have felt that if they let their scrap supplies go at the old ceiling prices only to see price controls eliminated, they would face definitely higher prices for steel products which they purchased. Some scrap on hand should controls be eliminated permanently would serve as a good bargaining point or at least a compensation for higher steel prices.

If OPA is resurrected this week there should be a substantial movement of scrap through trade channels, but there is a good probability that the amount uncovered will fall short of tonnages now being mentioned in the trade as representing "hold-back" scrap. If price controls are definitely eliminated from the country's economy this week the pressure for holding the line against scrap price advances may be dissipated by the action of some companies whose need for scrap is so great that higher prices would be offered rather than to reduce operations—at least this has been the normal trend in free markets before the war.

Despite the seriousness of the scrap and pig iron supply situations the steel ingot rate for the country this week advanced ½ a point to 89 pct of capacity. While some governmental authorities have gone so far as to say that the steel ingot rate may drop 30 pct within the next two weeks because of the dearth of scrap, such a decline seems quite improbable. Similar statements were made during wartime days, but subsequent events failed to prove their validity.

IN the nonferrous field the after effects of the mine, smelter and refinery strikes are still being felt, as evidenced by domestic production figures of copper, lead and zinc. Prices of lead and zinc are holding firm at the above-ceiling levels established recently.

Copper is being sold principally from Metals Reserve stocks at the recently increased ceiling levels. Remelted aluminum ingot has been increased again this week with no sales reported in copper, brass and bronze ingot. Aluminum scrap prices have been advanced as well as quotations on copper, brass and bronze scrap to levels above the old ceiling prices. Most trade sources feel that an elimination of price control on a permanent basis will result in some wide fluctuations in the nonferrous market.

• **CONSUMER DISAPPOINTMENTS**— Many consumers of steel goods are finding that the recent priority system did not entitle them to more tonnage. Continuous normal operations for two or three months will do much to clarify the availability of critical items. The makers of consumer goods involving flat-rolled products are finding that the orders placed with them have in many cases been padded. They expect that with production of these items coming along and delivery being made, that they may be able to shortly determine the actual demand for such goods. Their orders to the steel producers were based on the demands made by the public for such goods so that it is expected that pressure for delivery on certain products will level off and possibly fall short of what was initially ordered.

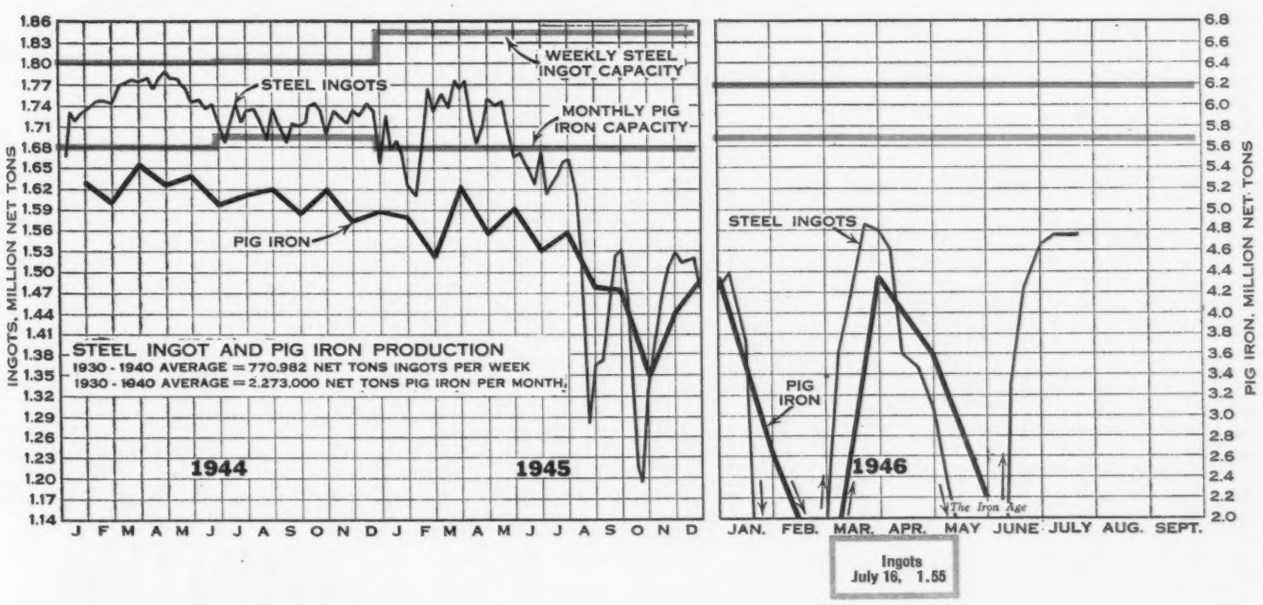
• **STEEL OUTPUT OFF**—Production of steel ingots and steel for castings during the first 6 months of 1946 was 27,364,714 net tons, approximately 16,000,000 tons below corresponding figures for 1945, according to the American Iron & Steel Institute. In the first half of this year, during which time the major strikes of coal miners and steelworkers occurred, the industry operated at an average rate of only 60 pct of capacity. The average rate during the first 6 months of last year was 91 pct, with production of 43,143,082 net tons. Production of steel ingots and steel for castings during June of this year was 5,660,386 net tons at an average of 74.9 pct of capacity. In May production was 4,072,452 net tons at a rate of 52.2 pct, according to revised figures. June production last year was 6,840,522 net tons at a rate of 87.1 pct of capacity.

• **CAR SHORTAGES**—The shipments of both finished goods and raw material have been delayed by shortages in rolling stock, particularly box cars. Over the past week there has been considerable improvement in available box cars but the heavy demands being made by the farm areas may further complicate this situation.

• **CERTIFIED ORDERS**—Certified orders have had a heavy impact on certain operations, especially galvanized sheet mills and bar and bar shape mills. At one galvanized sheet mill, 70 pct of the orders being shipped are certified, leaving only 30 pct of the mill's capacity for the remainder of the galvanized sheet customers. Likewise, the farm machinery manufacturers have tied up the bar mills and the mills manufacturing bar shapes to such an extent that very little is going into noncertified channels. CPA indicated that any increase in prices by steel companies should not discriminate against certified orders. Further, customers holding certified orders must be given seven days' notice in order to cancel their order in case of a price increase. In other words on certified orders the price is no longer that which is in effect at time of delivery, as has been the custom in the steel industry in the past.

• **BARBED WIRE**—Barbed wire demand is extremely heavy, with most producers dodging as much of this type of business as possible. Producers are making only what they have to in order that their distributors, mainly in agricultural areas, are satisfied. This week at least 60,000 tons of galvanized barbed wire business for export was searching for a home, 20,000 tons sought by Venezuela and 40,000 tons sought by Argentina. Neither of these orders found homes up to this week, and are not likely to in the immediate future.

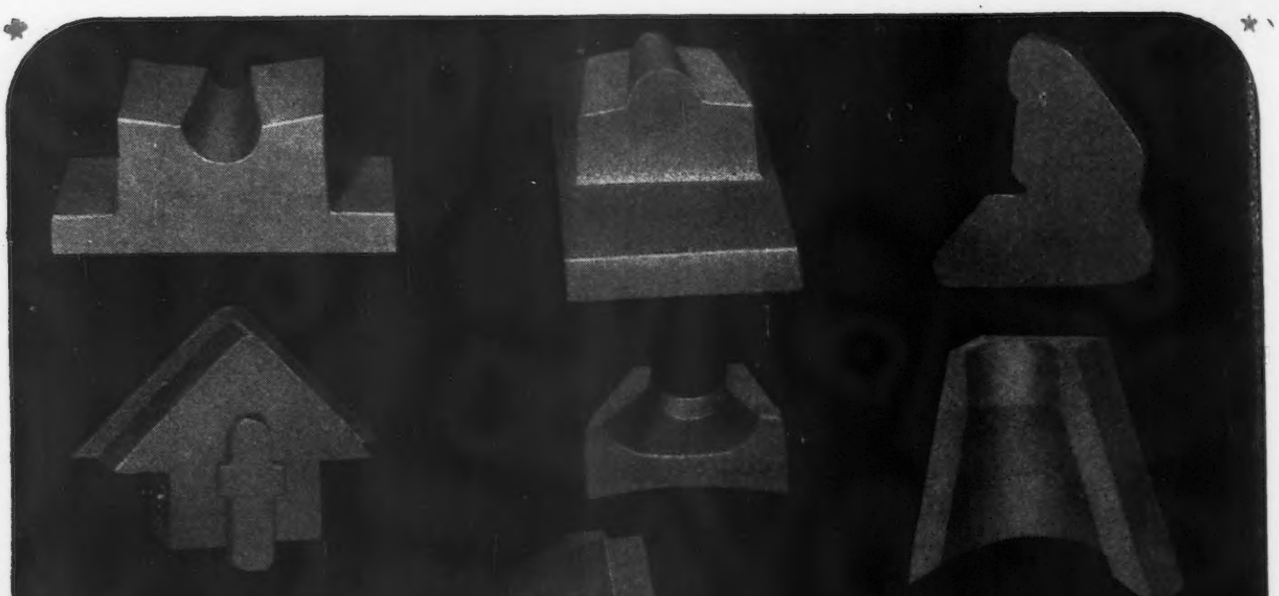
• **R.R. CAR BUILDERS' OUTLOOK**—Builders of cars and other railroad equipment are facing one of the heaviest backlogs of orders in their history. Most builders expect to resume normal operations in October providing the mills can achieve uninterrupted production. One of the noticeable increases in demand from such manufacturers is in wheels. Some of the larger companies are planning additional facilities to their wheel plants to meet and fulfill the unexpected increase in orders.


INGOTS, MILLION NET TONS
PIG IRON, MILLION NET TONS
WEEKLY STEEL INGOT CAPACITY
STEEL INGOTS
MONTHLY PIG IRON CAPACITY
PIG IRON
STEEL INGOT AND PIG IRON PRODUCTION
1930 - 1940 AVERAGE = 770,982 NET TONS INGOTS PER WEEK
1930 - 1940 AVERAGE = 2,273,000 NET TONS PIG IRON PER MONTH
1944
1945
1946
J F M A M J J A S O N D J F M A M J J A S O N D
JAN. FEB. MAR. APR. MAY JUNE JULY AUG. SEPT.
The Iron Age
Ingots July 16, 1.55

Steel Ingot Production by Districts and Per Cent of Capacity

Week of	Pittsburgh	Chicago	Youngstown	Philadelphia	Cleveland	Buffalo	Wheeling	South	Detroit	West	Ohio River	St. Louis	East	Aggregate
July 9.....	94.0	88.0	87.0	85.0	88.5	102.0	95.0	99.0	100.0	60.0	96.0	60.0	89.0	88.5
July 16.....	99.5	92.0	90.0	85.0	86.5	102.0	93.0	99.0	99.5	58.0	96.0	60.0	78.0	89.0

* Revised.



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Shipbuilding May Yield 12 to 15 Million Tons of Scrap

Baltimore

By JOHN ANTHONY
Eastern Regional Editor

o o o

• • • **The shipbreaking** industry is a potential source of 12 to 15 million tons of ferrous scrap during the next few years, excluding warship tonnage on which statistics are not now available, according to members of the industry.

With a current maritime fleet of some 52 million deadweight tons, Admiral Emory S. Land has estimated that the United States could be expected to operate in postwar maritime competition some 15 million deadweight tons with an average vessel tonnage of 10,000 deadweight. The balance is expected to be scrapped, some 3500 ships mostly Liberty type cargo carriers. The average net tonnage of cargo carriers now being offered shipbreakers is 4300, of tankers 2900. Maritime Commission contracts specify that the hulls must be scrapped within two years. Navy sales do not establish any time limit.

The shipbuilding industry which during the war constructed some 50 million deadweight tons of merchant vessels thereby consuming roughly 20 million tons of steel exclusive of Navy construction, has turned its attention to mass shipbreaking operations. While the activity has been going on in a limited way since the end of the war, equipment and personnel shortages have until now limited its scale of operations.

All Navy yards are now engaging in shipbreaking operations in competition with one another so far as costs are concerned. Navy cost figures are said to be detailed and studied carefully, a new departure for the shipbreaking industry. However, some commercial yards are now taking steps to break down their costs more accurately.

Shipbreaking scrap is very desirable for steel mills and foundry consumption since it is heavy and clean. Its only disadvantage is the paint it contains. Most ship scrap is sold as No. 1 or No. 2 heavy melting although some yards classify their output as low phos plate wherever possible, particularly in the present seller's market, so as to obtain the higher scrap price that has been established for this product. Occasionally, old iron hulled ships are scrapped and costs are lower because the plate burns and shears more easily than steel.

Shipbreaking operations are the reverse of shipbuilding, with torch cutting beginning at the superstructure and working down slowly toward the hull. The hull is later towed away for beaching and the final scrapping operations. The work must proceed with care for if important structural members were to be cut away too early in the work the ship would collapse and be lost.

All shipbreakers are adding to their facilities as deliveries are made of new cranes, alligator shears and cutting torches. Their scrap preparation activities are similar to those of scrap yards except that there is no need for bundling presses. Navy activities are confined to cutting warships into shipping sizes only without any attempt to remove nonferrous metals. Those who are familiar with Navy operations consider that buyers of Navy unprepared ship scrap are in a position to reap a considerable profit.

One of the largest commercial shipbreakers will be Bethlehem's Fairfield yard here on the Patapsco River at the former Union Shipbuilding and Drydock Co. yard owned by the Mellon interests. With more than half of Fairfield's equipment already in, an official expects scrap production here to reach 25,000 tons per month.

The next largest operation is probably the Boston Metals Co. here, operated by Morris Schapiro, formerly the Boston Iron and Metals Co. With a present capacity estimated at 6000 tons per month and new equipment coming in, it is believed that expanded capacity may reach 10,000 tons per month. This company operates another plant in Los Angeles, but it is not on tide-water.

The third largest factor in the industry is probably the Northern Iron and Metals Co. of Philadelphia operated by Max Rose which it is estimated could also reach 10,000 tons per month with additional shearing and handling equipment.

Other eastern shipbreaking yards are operated by the Potomac Shipwrecking Co. of Washington, D. C.; the Quaker City Iron Works of Philadelphia; North American Smelting Co., Philadelphia; and New Market Steel Co. of Perth Amboy, N. J.

There are no West Coast yards with significant shipbreaking experience as wage rates are relatively high there. However plants active are the American Iron and Metal Co. of Emeryville, Calif.; J. Goldman and Co. San Francisco; and J. R. Bundeson, Pittsburg, Calif.

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HUGHES ORIGINAL — *Hughes flying boat, said to be the largest in the world at a graving dock at Long Beach, Calif. The wing, 320 ft long, already joins the fuselage, while work on the tail assembly proceeds.*

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Steelmakers Rivet Attention on Precarious Scrap Outlook

New York

• • • **Members of the American** Iron & Steel Institute scrap committee met July 10 at Cleveland with the general conclusion being that steel firms were solidly against scrap prices being any higher than old OPA ceilings.

Fear was expressed, it has been learned, that the scrap situation is more serious than at any time in the past several years. So pinched have firms become that pressure will be put on steel consumers to return scrap to steelmakers direct. As a concession to dealers and brokers however, so that no change in the distribution picture would be made, steel companies agreed that scrap returned direct from consumers' plants will be routed through regular dealer or broker channels.

Some steel firms were known to be of the opinion that the scrap from customers should be returned direct without utilizing broker and dealer channels. Discussion of the problem however was said to have placed emphasis on the possibility of district dislocation in scrap supplies as well as the possibility that definite harm would be done to recognized and established distribution setups in the scrap industry.

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New York

• • • **A sharp drop in** the national steel production rate can be expected in a few weeks because the flow of scrap has fallen so seriously, said Carl A. Ilgenfritz, vice-president in charge of purchases, Carnegie-Illinois Steel Corp. and vice-chairman of the committee on iron and steel scrap of the American Iron & Steel Institute.

Already steel production is being lost because of the acute shortage of iron and steel scrap, which has grown worse recently because certain normal sources of supply have been withholding scrap tonnages from the market following the expiration of OPA, said Mr. Ilgenfritz.

"Inventories of scrap at steel mills average only 10 to 14 days' supply at present and in some cases it is reported that certain plants have only 1 to 2-days' inventory.

"Incoming shipments of scrap have declined to 35 to 40 pct of requirements. That means steel mills are being forced to draw upon inventories which are dwindling rapidly," Mr. Ilgenfritz said.

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Washington

• • • **Recognizing the** urgent need for scrap in order to prevent a sharp slump in steel production, John R. Steelman, Director of War Mobilization & Reconversion on July 15 announced a 10-point program calling for an intensive and sweeping drive through an inter-agency committee to step up the flow of old material to steel mills. Decision to institute the campaign was made at an inter-agency committee meeting held at the White House after the CPA reported that steel mills had less than two weeks' supply of scrap on hand.

Under the broad program, ships, guns, ammunition will be salvaged, and return of military scrap from overseas will be speeded up, although in trade circles there is doubt that battle scrap tonnage will be large.

The 10-point program follows:

(1) The CPA will issue a directive authorizing the WAA to lease surplus Navy and Maritime shipyards and other ship scrapping facilities to private operators.

(2) The Navy and Maritime Commission will immediately list all facilities suitable for ship scrapping operations, including those being retained in stand-by condition, which can be turned over to WAA on 24-hr notice for temporary lease.

(3) The Navy and Maritime Commission will make several hundred surplus ships immediately available for scrap salvage.

(4) The Army will notify overseas commanders of the urgent need for scrap in this country and instruct them to speed up the return of military scrap wherever this is possible.

(5) The Navy Dept. has directed commanders of all Navy yards and other installations in this country to place all available scrap on sale immediately. Ship breaking operations to provide more scrap will be pressed where this can be done without interfering with other urgent work. All Navy-owned machine tools which are no longer useful and have no commercial value will be scrapped and sold.

(6) The Maritime Commission will urge operators of ships returning empty to this country to load as much military scrap for ballast as they can obtain in foreign ports.

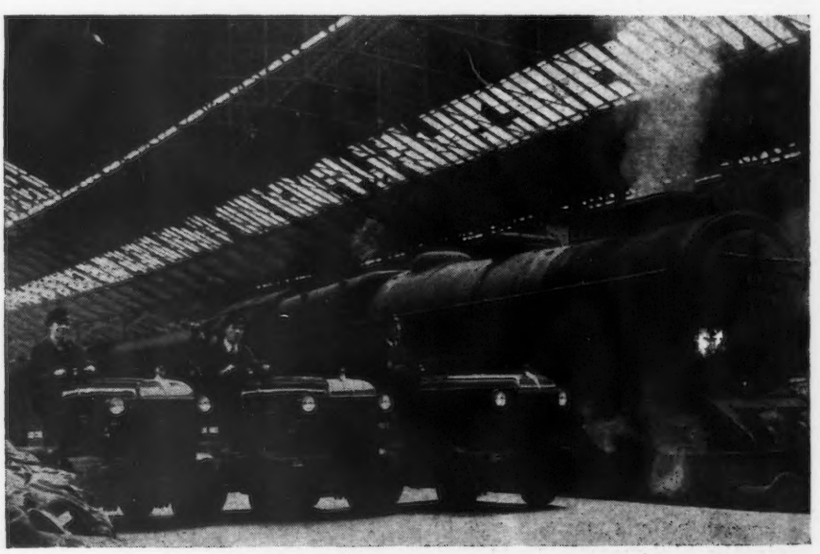
(7) The Army will endeavor to expand its current program of demilitarizing live ammunition and equipment.

(8) A joint War Dept.-CPA study will be started immediately to determine the extent to which alloy steel in guns, tanks and other armor plate can be used in civilian steel production.

(9) All agencies of the government will institute an intensive scrap housecleaning drive. The practice of accumulating piles of scrap before calling for bids will be discontinued during the emergency.

(10) The WAA will accelerate the sale of surplus machine tools which are obsolete or otherwise unsuitable for civilian production.

STATION TRACTORS: *Three of the very latest 12 hp station tractors are shown in operation at Euston Station, London. The vehicles can pull six heavily laden trucks of freight with ease.*



Strike Hits Canadian Steel Plants Despite Seizure by Government

Toronto

• • • **Canada's threatened** steel strike was called as advertised when CIO members walked out of the Dominion's three basic steel plants on July 15. Previously the government had seized the plants in an effort to block the strike which had long been threatened by United Steel Workers of America leaders.

The companies affected were Algoma Steel Corp., Dominion Steel & Coal Co., and Steel Co. of Canada. Shortly after the strike had paralyzed the former two plants the Steel Co. of Canada reported that 2000 workers were remaining at work in the company's Hamilton plant.

H. G. Hilton, president of Steel Co. of Canada, stated that on the first day of the strike coke production was practically normal, one blast furnace was operating and the No. 2 openhearth plant comprising nine of the largest furnaces, out of a total of 13, was in operation. Also running was the large electric furnace and the bloom, billet, bar and rod mills. Supplies for the men remaining within the plant were going in by boat and plane, Mr. Hilton said.

As a move to block the strike which involves some 14,000 workers, the Government had taken control of the three Canadian basic steel plants. Labor Minister Mitchell in a surprise announcement in the House of Commons July 10, reported appointment of F. B. Kilbourn of Montreal, as Controller of the Steel Co. of Canada Ltd., Hamilton, Algoma Steel Corp., Sault Ste. Marie, and Dominion Steel & Coal Co., Sydney, N. S. He will be assisted by three deputies—Bart Sullivan, Toronto, J. Argyle, Ottawa, and H. R. Pettigrove, Fredericton.

The three deputies, all Labor Department officials, will be assigned to individual plants; Mr. Sullivan will act for the Controller at the Steel Co. of Canada; Mr. Argyle at the Algoma Steel Corp., and Mr. Pettigrove at Dominion Steel & Coal Co.

Government officials announce that F. B. Kilbourn, Government controller in the Canadian basic steel industry, has made application for a 10 cent an hour wage increase at the three steel companies concerned.

Representatives of the United Steel Workers of America union have stated that unless steel workers are assured of "all or almost all" of their wage-hour demands they would continue the strikes in the steel plants despite Government efforts to avert a walk-out by appointing a controller over the affected companies. The union demands are for a minimum wage of $33.60 for a 40-hr week instead of the present 48-hr week, amounting in most cases to an hourly increase of 19½¢.

NEED A TRUCK?: *Surplus Army trucks ready for shipment from Japan. Some will be returned to the United States but most of them are to be shipped to the Far East, India, China and Korea for reconstruction work.*

Steel Firm Set For Airborne Operation

Hamilton, Ont.

• • • **To permit operations during the CIO strike which began on July 15 the Steel Co. of Canada put its supply system on a wartime footing. Cots were set up within the plant for more than a thousand workers and two railway refrigerator cars rolled in to supply food. Contact with the outside world was maintained by boat as well as by an aircraft landing strip set up within the plant compound.**

Sheet & Tube Gets Pipeline

Cleveland

• • • **Authorization to** construct and operate a 144-mile pipeline costing an estimated $4,620,000 has been granted the East Ohio Gas Co. here. The line will run from the Hope Natural Gas Co.'s outlet at the Ohio-West Virginia state line to the outskirts of Cleveland, according to the Federal Power Commission.

The proposed line will consist of 95 miles of 18-in. line extending from the Hope outlet at Pipe Creek on the Ohio River to the vicinity of Austintown Junction in the Youngstown-Warren area, and about 49 miles of 20-in. line to Dunham Station in Maple Heights, a suburb of Cleveland.

Youngstown Sheet & Tube Co. booked the order which totaled 26,000 tons of pipe.

WAA Has Scrap to Sell

Cleveland

• • • **Invitations for written** sealed bids on two 50-ton Porter steam locomotives and 11 bundles of cold-rolled steel, to be sold as scrap or salvage material, have been offered by the War Assets Administration here. The locomotives weigh about 200,000 lb. The steel bundles amount to 15,480 lb.

Written sealed bids on the steel must reach the regional office before 11.00 a.m., July 25.

Justice Dept. Disproves Sale to American Steel Foundries

Washington

• • • **Despite the Justice** Dept.'s recent disapproval of the March sale of the Ordnance Steel Foundry at Bettendorf, Iowa, to American Steel Foundries, the War Assets Administration plans no early action in regard to readvertising the property for sale, it was learned recently.

This inactivity indicates a wait-and-see policy on the part of WAA which coincides with a report here that instead of letting the matter drop, American Steel plans to take issue with the Justice Dept. regarding the latter's decision that such a sale would violate anti-trust laws.

A great deal of interest centers around the probability of such a course being taken by American Steel in view of Assistant Attorney General Wendell Berge's recent statement that in his opinion no firm would want to consummate a purchase which was regarded with disfavor by Justice. Also, such action would have the effect of dispelling some of the now existent confusion concerning the extent of Justice's control over surplus disposal.

Disapproval of the Department of the sale was announced after it had exercised the full 90 days allowed by law in which to render a decision. The award was made by WAA on Mar. 25 after consideration of bids, one of which had been submitted by the Bettendorf Co., headed by William Bettendorf of Bettendorf, Iowa, where the plant is located.

By KARL RANNELLS
Washington Bureau

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A bid of $1,050,000 was submitted by Bettendorf as against an offer of $1,290,000 by American Steel.

The Bettendorf offer, however, was for the entire property of 188.6 acres including both the Ordnance Steel Foundry and the Quad Cities Tank Arsenal plus all installed manufacturing facilities except the machine tools in the arsenal. The original cost to the government of these plants and equipment was approximately $4.8 million.

Opposed to the Bettendorf bid was that of the American Steel Foundries which offered $1,290,000 in cash for the Ordnance Steel Foundry alone. This was the bid accepted by WAA on Mar. 25. Later, the Tank Arsenal was advertised as a separate property and sold on June 25 to the J. I. Case Co. for $1,123,000.

In the meantime, aid of both Sen. Bourke Hickenlooper and Rep. Thomas Martin of Iowa was enlisted in behalf of the local firm which had operated the plant prior to its sale to the government. On at least two occasions, it is said that the Iowa legislators intervened with Mr. Berge on behalf of the local firm.

Finally, after a third communication from WAA pressing for a statement of the Department's attitude toward the award, Mr. Berge advised General Gregory on July 1 that in his opinion, acquisition of the property by the steel firm would be a violation of the anti-trust laws. This decision, he added hastily, should not be construed as implying that he approved of any alternate bid.

In support of his decision, Mr. Berge went on to say:

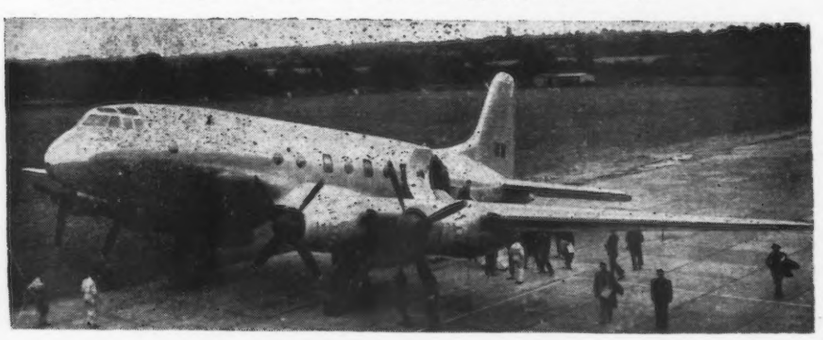
"The plant was operated prior to the war by the Bettendorf Co., producing principally railway specialty steel castings in competition with American Steel Foundries and others. The U. S. Army took over the plant in 1942 and expanded its facilities for production of tank armor. Present shortages of materials for construction of additional plants make it difficult to establish new enterprises in the steel casting field except through acquisition of government surplus facilities.

"In recent years, American Steel Foundries has enjoyed approximately 45 pct of the national business in side frames and truck holsters, the principal railway specialty steel castings. It also has a one-third ownership of General Steel Castings Corp. which is the exclusive manufacturer in the United States of the large one-piece steel castings used principally in locomotives. General Steel Castings Corp. does not engage in casting the smaller railway castings, and American Steel Foundries abandoned the large casting field at the time the relationship with General Steel Castings was established.

"This division of fields and a division of markets was for a time embodied in a definite agreement between the two companies. At least one agreement has come to the attention of the Department in which General Steel licenses American Steel to produce a railway specialty on condition that the patented product not be sold for use in connection with competitive railroad equipment.

"American Steel Foundries is also party to illegal restrictive agreements with other producers of railway specialties, which agreements are the subject of a pending civil anti-trust suit against American Steel Foundries and 11 other defendants."

BRITISH LUXURY LINER: *The new Hermes-Hastings which carries 34 to 50 passengers in a pressurized cabin at a cruising speed of 300 mph.*



Weekly Gallup Polls . . .

. . Presidential Popularity Declines in Past Year

Princeton, N. J.

• • • **While President Truman's** vigorous stand on the OPA issue won praise in many quarters, his popularity among the voters of the country had been declining sharply prior to the veto, according to George Gallup, director, American Institute of Public Opinion.

During a ten-day period between June 14 and June 24, interviewers for the institute questioned voters in all walks of life on their attitude toward the way Mr. Truman has been handling his job as President.

The results show opinion nearly evenly divided between approval and disapproval—a sharp drop from previous months when polls on the same question found substantial majorities approving his conduct of affairs in the White House. The decline has been one of the sharpest ever noted in the popularity of a major public figure.

The trend of sentiment in the past 12 months of the Truman administration is shown below:

"Do you approve or disapprove of the way Truman is handling his job as President?"

	Approve Pct	Disapprove Pct	No opinion Pct
July 1945	87	3	10
Oct. 1945	82	9	9
Nov. 1945	75	14	11
Feb. 1946	63	22	15
Apr. 1946	50	36	14
TODAY	43	45	12

With the no opinion vote excluded, the latest figures would be 49 pct approve, 51 pct disapprove.

In interpreting the poll results, four things should be borne in mind.

First, Mr. Truman's drop is undoubtedly a reflection of the return of major public interest to domestic matters after long concern with foreign affairs and the war. Roosevelt's popularity was given a big boost by the war, as politics was adjourned and people turned to face the foreign enemy. Today, playing politics is very much in vogue again.

Second, this poll's results were completed just before the President made known his stand on the OPA, and hence the balloting does not reflect the effect of his strong appeal for action against inflation and price rises. Polls during recent months indicated that a large majority of voters favored retaining price controls on rent, food, clothing and other essentials, a program which President Truman strongly supported.

Third, President Roosevelt once fell in popularity to a point virtually equal to that of Mr. Truman today. In comparable institute surveys taken during the Roosevelt administration, presidential popularity sank to as low as 50.5 pct, among voters with opinions, in early September 1935, at the end of a long and stormy session of Congress during which there was bitter debate over the Roosevelt administration's $4,800,000,000 relief bill, and much argument over reviving the NRA which had been killed by the Supreme Court.

Fourth, public opinion studies during the last decade show that Roosevelt's popularity tended to rise after Congress adjourned and political peace settled over the Potomac. If the same tendency works today, Mr. Truman's popularity might be expected to rise after Congress goes home this summer and the President's squabbles with the legislative body cease to occupy the headlines so prominently.

The poll results are a reflection of the country's attitude toward Mr. Truman as a White House personality, and do not necessarily reflect the strength of the Democratic Party as a political force. Reports on party strength will be made by the institute in the near future.

The President's handling of the strike problem, however, has had a mixed reception from the American people.

The majority with opinions on the subject express disapproval of his course, a poll by the institute finds, but the disapproval comes from both pro-labor and anti-labor factions, who give opposite reasons. Some disapprove because they think Mr. Truman has gone too far in opposing unions, while others disapprove on the ground that he has not gone far enough. It is a case where large groups are antagonized no matter what course he takes.

Voters' Opinion of Truman Hit New Low Just Prior to His Stand on Recent Issue of OPA

The sum total of opinion is reflected in the poll on the following question:

"Do you approve or disapprove of the way Truman is handling the strike problem?"

Interviews with a cross-section of voters took place during the last two weeks of June, well after the settlement of the rail and coal strikes and the calling off of the maritime strike.

The vote in the pole follows:

	Pct
Approve	36
Disapprove	49
No opinion	15

The criticism of White House handling of strikes, as reflected in the above figures, undoubtedly accounts for part of the drop in Mr. Truman's general popularity.

Analysis of this poll by occupation groups shows highest disapproval among two extremes of viewpoint—union members, and business and professional people.

The latter group feel that Mr. Truman has not taken a strong enough stand in curbing unions, while the former think he has gone too far in that direction.

The vote on Mr. Truman's handling of the strike problem:

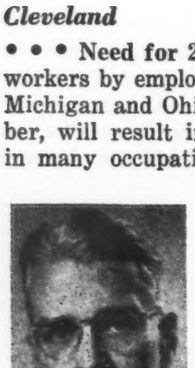
	Approve Pct	Disapprove Pct	No opinion Pct
Bus. & Prof.	37	56	7
White Collar	34	52	14
Farmers	42	43	15
Manual Workers	34	48	18
Union Members Only	30	56	14

(CONTINUED ON PAGE 166)

Severe Labor Shortage Seen by October in Midwest Areas

Cleveland

• • • **Need for 250,000 additional** workers by employers in Kentucky, Michigan and Ohio by mid-September, will result in labor shortages in many occupations, according to J. Kimball Johnson, U. S. Employment Service regional director for the three-state region.



J. K. JOHNSON

"However, elimination of restrictive hiring standards which have reappeared since VJ-Day will go far to provide employment for thousands of workers now registered with USES," he added.

While the total number of jobless workers in the region at the end of May amounted to approximately 350,000, based on the number of claims paid to unemployed veterans and to other workers and on the number of workers registered as seeking jobs at the local USES offices throughout the region, a number of specific skilled labor shortages exist at the present time, Mr. Johnson pointed out.

"The toolroom trades, machinists, toolmakers, and foundry workers, molders, core makers, pattern makers, are outstanding in this regard, along with sheet metal workers," he said. "But in Kentucky, there is a steady shortage of coal miners, with 1500 job orders standing unfilled, and while unemployment among women has been higher since the war, the higher skilled clerical positions for women are still hard to fill."

Nearly 10 pct of the 350,000 job seekers are handicapped, and while most of these are employable, the problem of finding suitable jobs for them and of securing employer acceptance will require considerable time and effort, Mr. Johnson predicted, adding that many of these unemployed are former war workers who will require retraining before they can be qualified to meet the current needs of industry. More than 50 pct of the unemployed men in some areas are veterans, seeking a specific job for which they have very little or no experience.

Labor turnover has gone down sharply, along with the ratio of referrals to hires, which last winter was three or four to one, and is now about 2.5 to 1, and as the impending labor shortage develops, this ratio may drop even lower, he said. At the same time the average work week is about 44 hr and indications are that this average will hold for the time being and then gradually increase with the increasing labor shortage.

According to Mr. Johnson, the bulk of the veterans are back in jobs, and although additional veterans will be discharged during the next few months to increase the labor supply, their numbers will be offset by further inductions and by the number of younger workers who will quit their jobs to return to school this fall.

"All these factors point to increasing shortages of qualified workers by this fall," the Regional Director declared. "Further evidence of this can be had from a study of the unfilled job orders which local offices have been reporting at the end of each month."

From the end of February to the end of May, unfilled job orders in this region's USES offices increased from 38,200 to 51,400. Many of these jobs were unfilled because of normal labor turnover, and because wages or working conditions were considered unsatisfactory. An increasing portion of them, however, were not filled, mainly because qualified workers were not available.

USES figures show that during the same four month period that these unfilled jobs were increasing, the number of workers applying for jobs at USES offices declined about 25 pct to 385,000. Current trends point to further sizable reductions.

Tracing the fluctuations of the labor market during the last year, Mr. Johnson pointed out that in this region, the reduction of nearly 30 pct in manufacturing employment during the period immediately following VJ-Day was followed by only a slight upward trend from last Sept. 15 to Mar. 15 of this year, despite the temporary setbacks due to strikes and shortages of materials or facilities.

From Mar. 15 to May 15, a rise in employment of more than 12 pct occurred in the 2000 plants included in the USES May survey. These establishments had a total employment of 1,447,100 on Mar. 15. By May 15, their employment totaled 1,623,000 workers. According to Mr. Johnson, production schedules of the plants up to Sept. 15 call for a further increase of 125,800 workers.

He said the substantial increase in manufacturing employment from last September to May was accompanied by a substantial employ-

Latest Trends in Midwest Employment

Cleveland

• • • Following are figures on: (1) Total non-agricultural employment in the United States (as estimated by the Census Bureau), (2) manufacturing employment in 1000 identical establishments throughout Ohio, (3) manufacturing employment for identical plants in four major areas in this region.

In each instance figures are shown for July 1945, the last full month before VJ-Day, to indicate the volume of wartime employment, for October 1945 to show the immediate effect of war contract cancellations on employment, and for May 1946, the most recent month for which comparable figures are available.

	July 1945	October 1945	May 1946
Total non-agricultural employment, United States *	44,430,000	42,770,000	46,440,000
Employment in 1000 Ohio manufacturing plants **	713,900	524,400	702,500
Employment in 340 identical plants, Detroit **	484,500	348,300	437,100
Employment in 163 identical plants, Cleveland **	206,400	145,000	158,200
Employment in 132 identical plants, Cincinnati **	97,600	62,700	63,100
Employment in 111 identical plants, Louisville **	74,000	51,100	52,700

* Source of Census. Estimates are for weeks ended July 14, Oct. 13, and May 11.
** Source U. S. Employment Service.

ment upswing in the construction trades and services industries.

"While our information as to the need for additional workers in these industries is not as complete as in manufacturing, our survey indicates such needs will continue throughout the summer at no less than the current rate. At least 125,000 more workers will, therefore, be needed in these three industries by fall."

Mr. Johnson based his estimate on a survey of over 1000 establishments engaged mainly in trades and services which currently employ nearly 500,000 workers, indicating a need for over 21,000 additional workers by Sept. 15.

In Mr. Johnson's opinion, these figures understate the situation, since very few construction projects were included in the survey, and the additional manpower requirements of those establishments not covered by the survey, while difficult to estimate, are believed to be proportionately larger than for those which were included.

"In this connection, the additional manpower needed by the construction industry alone is especially significant," he said. "While it is difficult to secure accurate figures on future needs, there is a growing scarcity of construction workers. It is known that a relatively large proportion of the 210,000 workers engaged in construction in this region in 1940 were older workers who have died, retired, or taken jobs in other industries and have not been replaced. During the war years there was little or no apprenticeship training. The impact of the veterans' emergency housing program and the planned industrial and commercial buildings will necessitate more skilled construction labor than is now available.

"We have, therefore, a situation which points to increasing need for additional qualified workers at the same time that the number of jobless is being sharply reduced. This means that additional training will have to be given to thousands of workers so that they can fill more of the types of jobs now unfilled and for which more workers will be needed. It also means that the qualifications for filling thousands of other jobs will have to be made less exacting so that more of the workers now unemployed can meet them," Mr. Johnson concluded.

Carriers Adjust Car Shortage To Ease Steel Deliveries in Midwest

Chicago

• • • **Concentrated effort** by the railroads has remedied the car shortage. Steel deliveries, at present, are not being held up for lack of cars.

One remedy to the spasmodic box car shortage is being attempted. Many such cars sent West or South are not fit for shipping agricultural produce but are perfectly usable to the steel producers. The railroads are attempting to cull out these cars on through trains to the grain areas and thus keep a better balanced inventory available for other shipments.

During the past few weeks, shipments of tinplate, nails, sheets and wire, were sometimes held up by an acute shortage of box cars. These items, which are always shipped in such cars, will suffer periodic delay for the rest of the summer because of the seasonal demand in agricultural areas. It has been the usual practice to let the large industrial areas build up a demand for cars and then divert whole trains so that needs are satisfied almost over night.

Companies shipping finished goods by boat are usually promptly handled and these organizations report their needs being fairly well met. Water shipment of steel products does not require a large proportion of box cars but does need long open cars. Railroads have never recognized the industry's plea for more 65-ft cars, with the present percent of long cars out of available rolling stock being approximately 1 in 10. For this reason some producers have been asking that their customers accept shorter lengths in certain products, particularly concrete reinforcing bars, to try to expedite delivery. This situation will not improve until additional longer cars are put in service or the volume being handled by the roads tapers off.

The recent increase in freight rates has caused diversion to water shipment in a few isolated cases. Water transportation will continue to be used whenever possible and has always been practiced to a great extent. Although tonnages recently diverted have been small they will increase should the roads be allowed further adjustment in rates. Actually the recent rate increases on steel items are much more satisfactory to the roads than has been generally assumed, although further relief may be requested.

Guild Elects Officers

Pittsburgh

• • • **At a recent** meeting of the Electric Metal Makers Guild, Inc. the following officers were elected for the coming year: President, J. E. Arthur, superintendent of melting, Crucible Steel Co. of America, Park Works, Pittsburgh; vice-president, R. H. Frank, superintendent of melting, Bonney Floyd Co., Columbus, Ohio; secretary-treasurer, D. L. Clark, superintendent of melting, Simonds Saw & Steel Co., Lockport, N. Y.

CALL IT AERO-VAN: *Proposed to carry commercial goods and/or passengers this Miles built British plane is test model for proposed future production. With a cruising range of 450 miles, the reported speed at cruise power is 110-115 mph.*

UAW-CIO Rally Plans Indicate Determination to Hold Price Line

By WALTER G. PATTON
Detroit Regional Editor

Detroit

• • • **The automotive** labor front erupted this week in a manner that left little doubt that the UAW-CIO is determined to have its own way about OPA and the purchasing power of the automobile worker.

"Fight Inflation" rallies were scheduled for Flint, Detroit and other Michigan cities for the expressed purpose of convincing Congress that OPA (or a reasonable facsimile thereof) must be reinstated. Workers were requested to ask plant managers to shut down industrial plants to permit attendance at these rallies and to shut the plants anyway in the event that management declined to cooperate. Flying squadrons have been revived for the purpose of reinstating evicted tenants and swooping down on merchants who hike prices. And Chrysler Corp. has been notified of the union's intent to ask for a general wage raise to which may be attached requests for a Lewis type health fund and other security measures for the worker.

All Flint plants were scheduled to halt work on Tuesday of this week to enable workers to participate in a parade through the downtown section preceding a rally that is reported to be sponsored jointly by AFL and CIO. Walter P. Reuther, president of the UAW-CIO will be the principal speaker.

Later the same day, a similar rally was to be held in Cadillac Square, Detroit, with Walter Reuther scheduled to address the gathering.

In calling the Detroit meeting, the UAW-CIO has used a new technique heretofore unemployed by UAW strategists in this area. During the week preceding the rally, yellow handbills signed by Walter Reuther had been widely distributed in industrial plants urging workers to turn out in force. The wording of the handbill is of unusual interest not only as a propaganda document but also because it calls on workers to participate in the rally even though plant managers fail to agree to the proposal to shut down plants for 2 hr to permit participation.

"Take all steps necessary to insure participation in the rally . . . If it is necessary to close down the plant for part of one or more shifts so that all workers may attend, every effort should be made to work out an agreement with plant management to that effect.

"If managements refuse to agree to that arrangement, local unions are hereby authorized by the International Union to shut their plants for not more than 2 hr on any one shift on the day of the demonstration."

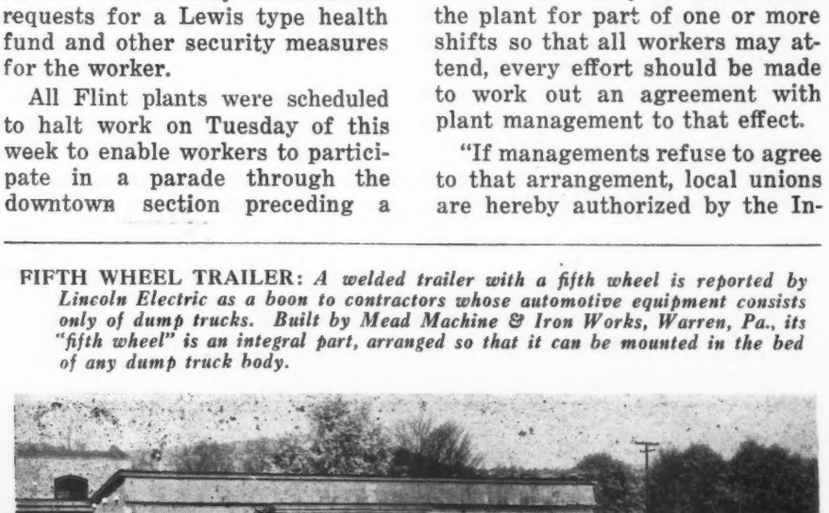
Simultaneously, a mimeographed highly emotional appeal was being distributed in office buildings in the business section of the city urging white collar workers to join in the rally and calling attention to the fact that office workers have received no raises of 18½¢ and that their wages are being cut in half by rising prices. The handbill is signed by "The 2500 white collar workers, members of the United Office & Professional Workers of America, CIO."

While the purpose of the statewide anti-inflation rallies is to "fight inflation," it is obvious that the huge public demonstrations are also aimed at dramatizing the current campaign of the union to maintain the "real wages" of Detroit workers. As a spokesman for the union pointed out, the union believes that the buying power of the worker can be maintained either by reducing prices or by raising wages. For the present, he said, the union would prefer to roll back prices rather than start another round of wage raises in the automobile industry. The wage-level should be equivalent to OPA conditions, he explained.

Meanwhile, the UAW-CIO is preparing for any eventuality and has made it clear that notice will be filed with the Chrysler Corp. calling for negotiation of a new wage agreement to succeed the contract signed early this year which granted Chrysler workers an increase of 18½¢ per hr. Under the terms of the contract now in force the union may at any time petition for a wage increase. At the expiration of a 60-day period, wage negotiations will begin. During this 60-day period the union has indicated that it will undoubtedly file a statement of intent to strike which will permit the calling of a work stoppage as soon as it has become evident that negotiations will be unsuccessful.

While the basic point at issue in the Chrysler negotiations will be wages, it will surprise practically no one if demands for a health fund similar to John L. Lewis fund and other provisions for workers' security are tied into the bill of complaint.

FIFTH WHEEL TRAILER: *A welded trailer with a fifth wheel is reported by Lincoln Electric as a boon to contractors whose automotive equipment consists only of dump trucks. Built by Mead Machine & Iron Works, Warren, Pa., its "fifth wheel" is an integral part, arranged so that it can be mounted in the bed of any dump truck body.*



The London ECONOMIST

Warning From the West

Reprinted by special permission to further understanding on how political and economic affairs are viewed in London.

° ° °

WHILE the political future of the world is being decided in Paris, its economic future is being decided in Washington. One crucial decision was reached last week, when Congress and the President failed to agree on a price control measure. And another crucial turning point will be reached towards the end of next week when the House of Representatives votes on the dollar credit to Great Britain. It would be a mistake to dismiss the quarrel over price control as the less important of the two issues or as a matter of purely domestic significance. The Anglo-American loan agreement is the keystone of an arch of policy that rests wholly on the twin pillars of stability in American foreign and domestic economics.

Unless the United States is willing to buy or lend as much as it sells, no international monetary system, that of Bretton Woods or any other, can be expected to work. And unless the United States can achieve a reasonable degree of relief from the disastrous alternation of boom and slump, other countries, instead of seeking closer and freer trading relations with the American economy will be forced in self-defense to erect what insulating barriers they can contrive against the violence of its instabilities. Thus last week's events and next week's vote are the two sides of the same medal. Both are evidence in the great question whether America is going to be a good economic neighbor.

Not that the death of the Office of Price Administration and its price control powers is in itself likely to have such immediately disastrous effects as some of the excited American comment on it might lead one to suppose. It is improbable that all price controls will be completely removed. The states have some residuary powers, particularly in the sphere of rent control, and an attempt is in progress to continue the OPA, with its powers intact, for a week or two while the President and Congress make another attempt to agree.

Prices in America have been rising steadily, though as yet still slowly, all through the war. It was already clear that this process would be speeded up in the second half of 1946. It may now go still more quickly, and there may be an even larger and prompter crop of demands for increased wages. But it would be quite wrong to imagine that a new OPA act would be the difference between stability and inflation; it would, at the most, be the difference between two rates of speed in rising prices.

IT is a symptom of a state of mind that the abandonment of price control is most significant. Its most important meaning is that America is having a boom and enjoying it. There can be no doubt about the boom. The June issue of *Fortune* has caught the fever even in its prose:

> There is a powerful, a consuming demand for everything that one can eat, wear, enjoy, burn, read, patch, dye, repair, paint, drink, see, ride, taste, smell and rest in . . . Throughout the nation there is at large a vast force of spending money, surging violently about the economy, like an Olympian bull in an old curiosity shop, battering its way in and out of stores and through the banks and into the stock market and off to the black market and on into the amusement industry . . . There seems to be no bottom to the demand, no bottom to the American purse.

To a tired and skeptical island of austerity there is a note of fantasy about the reports. In the early months of 1946, the consumption expenditure of the American people reached the annual level of $120 billion. This means that, after all taxes, savings and capital expenditures, counting nothing but pure consumption, the average American family was spending at the rate of £1,000 a year. It is this incredible buying spree that the American people does not want to have disturbed by any controls, by any hint of economic constraint or planning, or by any thought of the future save that it will have to take care of itself.

SO long as it lasts, the American boom is, on balance, an advantage to other countries and specifically to Great Britain. It is true that rising prices reduce the value of the dollar loan—though if the prices stay up, they also reduce the burden of repayment. It is true also that American unrestrained buying power will suck in supplies that are badly needed elsewhere, and this may have a disastrous effect on the world food situation. But rising American prices enhance the prospects of British export sales, both to America itself and to other countries. And the extravagance of the boom may improve the relative standing of the pound sterling and the attractions of London as a safe deposit.

The big question is how long it will last and what happens next? One of the remarkable features of the present time in America is the universal belief in the inevitability of a slump in 1950 or thereabouts. This very unanimity ought to make the prophet cautious. But the popular view may, after all, be correct. If 40 million Frenchmen can't be wrong, 140 million Americans may be right. Or they may be right at the wrong time—there are many sound judges who think that a boom lasting until 1950 would be a very long boom indeed. The lesson of recorded economic history would be that there never has been a boom of the strength and extravagance that this one is acquiring without a corrective reaction of greater or less intensity. In a boom atmosphere, all sorts of absurdities and over-calculations

(CONTINUED ON PAGE 166)

Bolt Price Increase Now Totals 12 Pct Over 1941 Ceilings

New York

• • • **Manufacturers of bolts,** nuts, screws and rivets came in just under the wire ahead of the expiration of the Office of Price Administration with the granting by the OPA of a 5 pct increase in ceiling prices under Amendment 3 to RMPR 147, effective July 1, 1946. Also, resellers of bolts, nuts, screws and rivets were authorized to pass on this increase by the issuance of Amendment 13 to SR 14G, also effective July 1, 1946.

This increase of 5 pct, effective July 1, was in addition to a previous increase of 7 pct granted as of April 1, 1946. Amendment 3 to RMPR 147, however, provides for the rescinding of the previous 7 pct and the substitution therefor of 12 pct above the 1941 ceiling levels. The same increase applies to resellers of these products.

Although the OPA law expired as of midnight, June 30, the manufacturers of bolts, nuts, screws and rivets, as individuals, very generally have put the newly authorized 5 pct increase into effect. Industry spokesmen state that they have had sharp increases in costs during the last year. In its "Statement of Considerations" involved in the issuance of Amendment 3 to RMPR 147, the OPA said in part:

"The present increase in maximum prices was calculated by using as a starting point the data upon which Amendment 2 was based and adjusting them to give effect to cost factors which were not previously taken into account. It appears that to date firms producing approximately 70 pct of the total output of bolts, nuts, screws and rivets have granted wage increases and have received approval of such increases for pricing purposes either by specific action on the part of the National Wage Stabilization Board or by virtue of its General Order No. 1. Other firms are expected to grant wage increases in the near future."

AMERICAN IRON AND STEEL INSTITUTE
CAPACITY, PRODUCTION AND SHIPMENTS
Period MAY - 1946

Steel Products	Number of companies	Items	Maximum Annual Potential Capacity Net Tons	Current Month: Production Net Tons	Current Month: Production Per cent of capacity	Current Month: Shipments (Net Tons) Total	Current Month: Shipments (Net Tons) To members of the industry for conversion into further finished products	To Date This Year: Production Net Tons	To Date This Year: Production Per cent of capacity	To Date This Year: Shipments (Net Tons) Total	To Date This Year: Shipments (Net Tons) To members of the industry for conversion into further finished products
Ingots, blooms, billets, tube rounds, sheet and tin bars, etc.	39	1	xxxx	xxxx	xxx	195,850	86,776	xxxx	xxx	* 1,230,677	587,065
Structural shapes (heavy)	12	2	9,421,550	178,704	23.2	201,236	xxxx	1,077,257	28.9	* 1,142,422	xxxx
Steel piling	4	3		6,748		7,501	xxxx	49,208		41,364	xxxx
Plates (sheared and universal)	27	4	17,080,770	262,791	18.1	281,697	18,738	1,414,570	20.0	1,432,920	97,184
Skelp	5	5	xxxx	xxxx	xxx	9,289	6,916	xxxx	xxx	133,350	59,357
Rails—Standard (over 60 lbs.)	4	6	3,657,000	89,220	28.7	96,594	xxxx	549,428	36.3	550,517	xxxx
—All other	5	7	392,000	11,439	34.3	11,917	xxxx	50,081	30.9	50,374	xxxx
Splice bars and tie plates	12	8	1,745,960	39,931	26.9	44,230	xxxx	216,348	29.9	235,007	xxxx
Track spikes	10	9	349,400	11,280	38.0	12,274	xxxx	49,757	34.4	53,955	xxxx
Hot Rolled Bars—Carbon	33	10	xxxx	454,679	xxx	386,238	38,059	2,317,665	xxx	* 1,940,602	241,501
—Reinforcing—New billet	15	11	xxxx	80,033	xxx	80,613	xxxx	320,524	xxx	* 342,825	xxxx
—Rerolled	12	12	xxxx	15,797	xxx	13,936	xxxx	50,169	xxx	51,037	xxxx
—Alloy	22	13	xxxx	121,287	xxx	116,491	10,741	551,705	xxx	464,645	47,791
—TOTAL	39	14	21,906,660	671,796	36.1	597,278	48,800	3,240,063	35.7	* 2,799,109	289,292
Cold Finished Bars—Carbon	24	15	xxxx	98,474	xxx	99,390	xxxx	468,553	xxx	468,565	xxxx
—Alloy	23	16	xxxx	19,193	xxx	16,750	xxxx	78,316	xxx	69,146	xxxx
—TOTAL	31	17	2,851,510	117,667	48.6	116,140	xxxx	546,869	46.3	537,711	xxxx
Tool steel bars	18	18	255,010	10,207	47.1	10,016	xxxx	42,282	40.1	41,475	xxxx
Pipe & Tubes—Butt weld	14	19	2,176,520	108,636	58.7	110,605	xxxx	490,072	54.4	482,021	xxxx
—Lap weld	9	20	730,200	15,200	24.5	21,239	xxxx	93,292	30.9	108,358	xxxx
—Electric weld	10	21	1,536,900	58,170	44.5	46,245	xxxx	260,806	41.0	215,932	xxxx
—Seamless	13	22	3,169,600	173,035	64.3	159,196	xxxx	767,745	58.5	683,118	xxxx
—Conduit (cap. & prod. incl. above)	6	23	xxxx	xxxx	xxx	6,975	xxxx	xxxx	xxx	31,945	xxxx
—Mech. tubing (cap. & prod. incl. above)	11	24	xxxx	xxxx	xxx	40,755	xxxx	xxxx	xxx	161,845	xxxx
Wire rods	25	25	7,293,670	339,152	54.7	69,156	23,940	1,537,441	50.9	368,119	133,642
Wire—Drawn	39	26	5,702,890	286,030	59.0	178,009	11,896	* 1,214,899	51.5	* 709,567	50,244
—Nails and staples	18	27	1,260,360	50,837	47.5	51,457	xxxx	206,286	39.5	206,493	xxxx
—Barbed and twisted	15	28	543,610	18,862	40.8	18,705	xxxx	80,710	35.9	79,177	xxxx
—Woven wire fence	15	29	1,121,860	33,687	35.3	33,205	xxxx	146,623	31.6	146,719	xxxx
—Bale ties	12	30	149,700	7,612	59.8	8,173	xxxx	28,948	46.7	31,315	xxxx
Black Plate—Ordinary	9	31	xxxx	xxxx	xxx	64,765	124	xxxx	xxx	* 297,652	789
—Chemically treated	8	32	465,000	10,986	27.8	11,661	xxxx	54,517	28.3	54,223	xxxx
Tin and Terne Plate—Hot dipped	9	33	3,758,850	167,990	52.6	158,545	xxxx	645,232	41.5	690,534	xxxx
—Electrolytic	9	34	2,231,850	84,825	44.7	82,019	xxxx	319,051	34.5	330,615	xxxx
Sheets—Hot rolled	30	35	19,353,320	1,128,815	68.7	517,302	24,667	4,804,734	60.0	* 2,126,165	139,611
—Cold rolled	13	36	7,127,460	456,750	75.4	320,763	xxxx	1,902,977	64.6	1,287,372	xxxx
—Galvanized	16	37	2,924,130	113,518	45.7	122,904	xxxx	527,173	43.6	532,045	xxxx
Strip—Hot rolled	25	38	7,180,030	186,299	30.5	117,720	17,530	830,640	28.0	536,664	80,627
—Cold rolled	34	39	3,067,450	123,043	47.2	120,953	xxxx	488,723	38.5	480,594	xxxx
Wheels (car, rolled steel)	5	40	315,400	19,232	71.8	21,297	xxxx	87,980	67.4	94,154	xxxx
Axles	6	41	398,170	8,405	24.8	9,840	xxxx	43,219	26.2	44,890	xxxx
All other	3	42	169,510	3,874	26.9	553	xxxx	17,776	25.3	1,961	xxxx
TOTAL STEEL PRODUCTS	140	43	xxxx	xxxx	xxx	3,906,064	239,387	xxxx	xxx	*18,051,360	1,437,811
Effective steel finishing capacity	140	44	64,059,000	xxxx	xxx	xxxx	xxxx	xxxx	xxx	xxxx	xxxx
Percent of shipments to effective finishing capacity	140	45	xxxx	xxxx	xxx	67.4%	xxxx	xx-xx	xxx	62.7 %	xxxx

* Adjusted.

During 1945 the companies included above represented 98.4% of the total output of finished rolled steel products as reported to American Iron and Steel Institute.

Shortages of Some Raw Material Items Hamper Steelmaking Operations

Chicago

• • • **Supply of raw** materials for steelmaking remains tight but only in certain items. Chief headache to the fully integrated maker is scrap, whereas the smaller producers are short scrap and pig iron.

The pig iron situation continues to grow worse. Reliable sources report that the total tonnage of merchant iron being produced has dwindled from the wartime peak. During the war the high production in many cases was a must and was subsidized to some extent by government agencies.

The large producers of iron and steel are not interested in merchant pig iron production at the present price. And as long as scrap remains difficult to get, steelmakers will be forced to use their iron for steel production if present operation levels are to be maintained. Aside from the price angle, the crux of future production of pig iron is the supply of coal.

Metallurgical coke necessary for pig iron production is entirely dependent upon district 7 and 8 for supply. Regardless of the present record production of coal out of the mines, coal stockpiles are at an all-time low and there will not be sufficient time to build these stocks up by using water transportation.

Ore and stone are plentiful but early winter will find an acute coal shortage at the docks in this area. At the present price of pig iron, the thought of having to bring coking coal in by rail is said to be intolerable. Pig iron continues to be sold at the old OPA ceiling price.

Once the industry is assured that OPA will not be reincarnated in some form, the price of pig iron will be immediately increased with subsequent assured production. Free market conditions seem to be the only hope for inducing ironmakers back into the merchant field.

The recent priority system inaugurated by CPA covering iron for manufacturers of certain critical items will have no affect on the availability of iron. The priority system does not change the quotas already allocated throughout the industry but merely insures the producer of such items that his quota will be shipped in the month allocated. The bulk of these priorities will fall in the South where the heavy tonnage of cast iron pipe is made. The iron needed for foundries making castings for the implement trade is not expected to be a large factor.

Fluorspar and clinkered dolomite are readily available and steelmakers are finding no difficulty in securing their requirements. Fluorspar continues to be sold at the old OPA ceiling price but clinker dolomite is up 75¢ per net ton. Hard ore has always been more or less short but due to recent strikes, this item is somewhat scarcer than it has been.

Future steel operations, it was said by a large producer, will center more on the availability of coal than its more publicized partner scrap. The barometer is expected to fall, particularly during the winter months, unless the OPA stays dead and business once more finds itself in business.

Steel Shipments Better, Inventories Still Lag

Pittsburgh

• • • **Steel processors** and fabricators in this area are considerably more optimistic about operations than they have been for the past 6 months. They indicate that, while inventories of steel are not accumulating as fast as would be desired, shipments are considerably more consistent, permitting smoother and better plant operation.

Apparently, the last week in May was the low point for fabricators as far as steel supplies were concerned. But by the end of June, steel began to come into these plants in volume. If manufacturers can get through July without curtailing operations, it is felt that the climb back to full scale production and normal operations will be a steady one, coming sometime near the end of the year.

One manufacturer in this area indicated that there is little efficiency in operations at the present time because both the inadequate supply of steel and the desire to take care of a greater number of customers makes long runs impossible. Rescheduling and roll changes in the mills slow down operations. This manufacturer indicated that during the first 26 weeks of this year, eight weeks of production had been lost, five weeks because of the steel strike and three weeks because of the coal strike.

While it is a nip and tuck fight to keep operations at peak now, August apparently will see an improvement in finished goods output. Some inventories are being worked up, evident from such cases as the reopening of the Etna (Spang Chalfant) plant of National Supply this week. This plant, closed since about May 30, was opened recently because it was felt that sufficient skelp was on hand and available for continuous, uninterrupted welded pipe and conduit production.

Hand sheet mills, except those depending upon outside sources of sheet bar, apparently are in fair shape from a steel supply standpoint. One producer indicated that his plant would soon hit capacity production, and steel has been coming into the plant in consistently better quantity. Another sheet producer likewise indicated that steel supplies were in better volume, but the main difficulty with this company's operations was the shortage of scrap at its steelmaking end.

It is the consensus that these plants could handle a substantially larger inventory than they have been able to accumulate, but the fact that steel shipments are moving in better volume and more consistently has cleared away much of the pessimism concerning operations that was evident 45 to 60 days ago. Further, barring strikes and unforeseen work stoppages at steel producing plants, it is the opinion of producers and consumers alike that steel supplies will get continually better for the remainder of the year, permitting full scale operations on the most economical basis for each plant.

Pig Iron Makers Push Output Despite Rise In Material Prices

Pittsburgh

• • • **While merchant iron** supplies have been and are extremely critical, the recent increases in costs of coal and freight have not diminished iron production. Producers are being pushed pretty hard by consumers for iron, and it is general opinion that present costs mean that producers are losing money.

One producer in this area recently notified all its customers that it intended to increase the price of pig iron as soon as feasible, regardless of the outcome of the OPA battle, and all iron shipped from July 1 would have to be accepted on the basis that the increase would be retroactive to that date. This company will attempt to collect the price increase retroactive to May 29, the date set by OPA. However, if OPA is not reinstated, it is felt that difficulty will be experienced in collecting any price increases retroactive to May 29.

Estimates by analysts in the industry indicate that if OPA is revived, the price increase will range from $2.50 to $3.00 a ton, whereas if OPA is definitely out the window, the price increase may range up to $3.50 a ton. This, in the face of the recent increases of Sloss Sheffield and Woodward of $3 a ton and Republic Steel of $4 a ton at Birmingham, does not appear to be out of line with what OPA would have granted had it continued in operation. As a matter of fact, the $4 a ton increase made by Republic was granted by OPA, while the other producers increased their prices $1 a ton less than the OPA approved increase.

Marginal furnaces have long since been taken out of operation and will probably not come back until such time as it is definite what the price increase is going to be on an industrywide scale. These producers would not jeopardize what working capital they have in order to get a $1 or $2 a ton increase if there were a chance that OPA would be revived and the price situation would again be thrown into turmoil. Further, for these producers to resume blast furnace operations would be a mad scramble for raw materials and would tend to make more difficult a situation that is now almost impossible. The furnaces that are now in operation are the old standby units, that even in the face of recent increases in cost will not likely go out of operation.

The increased prices approved by OPA for various requirements for blast furnace operation, such as coal, coke, freight, refractories, etc., have cost blast furnace operators about $2.25 to $2.50 per ton of iron produced, according to some observers. No recovery of this cost has as yet been realized, and until iron prices are increased, no recovery is in sight.

Coming Events

July 22-23 American Washer & Ironer Manufacturers Assn., French Lick, Ind.

Sept. 10-14 American Chemical Society, exposition, Chicago.

Sept. 11-12 Society of Automotive Engineers, national tractor meeting, Milwaukee.

Sept. 16-20 Instrument Society of America, first conference and exhibit, Pittsburgh.

Oct. 1-4 Iron & Steel Exposition, Cleveland Public Auditorium, Cleveland.

Oct. 3-5 National Electronic Conference, Chicago.

Oct. 3-5 Society of Automotive Engineers, aeronautic meeting and display, Los Angeles.

Oct. 9-11 Porcelain Enamel Institute, University of Illinois.

Oct. 10-12 American Society Tool Engineers, semi-annual convention, Pittsburgh.

Oct. 24 American Welding Society, New York.

Oct. 28-30 American Gear Manufacturers Assn., semi-annual meeting, Chicago.

Oct. 29-Nov. 1. Refrigerator Equipment Manufacturers Assn., exposition, Cleveland.

Nov. 7-8 National Founders Assn., New York.

Nov. 18-22 National Metal Congress and Exposition, Atlantic City, N. J.

Dec. 2-4 Society of Automotive Engineers, air transport meeting, Chicago.

Dec. 2-7 National Power Show, New York.

Asks Credit for Foreign Buyers of U.S. Surpluses

Washington

• • • **The National Advisory** Council, headed by Secretary of the Treasury John B. Snyder, has recommended that credit terms, similar to those now extended to American buyers of surplus property, be extended to foreign governments, WAA has announced.

NAC also recommended that certain domestic surplus property, which cannot be moved on existing credit terms either to American interests or foreign governments, be offered, except when limited by statute, to interested foreign governments on terms conforming with those extended by the Import-Export Bank for reconstruction and development loans. Credit ceilings for individual countries will be referred to NAC by WAA for approval, it was brought out.

The recommendations came as the result of conferences among WAA officials and NAC representatives, including the Secretary of Commerce, Assistant Secretary of State, members of the Federal Reserve Board, and representatives of the Import-Export Bank.

AMERICAN IRON AND STEEL INSTITUTE

Production of Open Hearth, Bessemer and Electric Steel Ingots and Steel for Castings

YEAR 1945

Based on Reports by Companies which in 1945 made 97.6% of the Open Hearth, 100% of the Bessemer and 85.8% of the Electric Ingot and Steel for Castings Production

Period	Estimated Production—All Companies								*Calculated weekly production, all companies (Net tons)	Number of weeks in month
	OPEN HEARTH		BESSEMER		ELECTRIC		TOTAL			
	*Net tons	*Percent of capacity	Net tons	Percent of capacity	*Net tons	*Percent of capacity	*Net tons	*Percent of capacity		
January	6,469,340	90.5	379,062	76.0	355,910	76.8	7,204,312	88.8	1,626,256	4.43
February	5,968,326	92.4	347,227	77.1	337,212	80.6	6,652,765	90.8	1,663,191	4.00
March	6,927,939	96.9	398,351	79.8	379,639	81.9	7,705,929	95.0	1,739,487	4.43
1st Quarter	*19,365,605*	*93.3*	*1,124,640*	*77.6*	*1,072,761*	*79.7*	*21,563,006*	*91.5*	*1,676,750*	*12.86*
April	6,541,627	94.5	372,952	77.2	375,308	83.6	7,289,887	92.8	1,699,274	4.29
May	6,664,117	93.2	402,100	80.6	383,450	82.7	7,449,667	91.8	1,681,640	4.43
June	6,129,763	88.5	379,807	78.6	330,952	73.7	6,840,522	87.1	1,594,527	4.29
2nd Quarter	*19,335,507*	*92.1*	*1,154,859*	*78.8*	*1,089,710*	*80.0*	*21,580,076*	*90.6*	*1,658,730*	*13.01*
1st 6 Months	*38,701,112*	*92.7*	*2,279,499*	*78.2*	*2,162,471*	*79.9*	*43,143,082*	*91.0*	*1,667,688*	*25.87*
July	6,318,975	88.6	381,832	76.7	284,764	61.6	6,985,571	86.3	1,580,446	4.42
August	5,172,344	72.3	347,088	69.5	215,885	46.6	5,735,317	70.7	1,294,654	4.43
September	5,435,799	78.7	352,847	73.2	193,829	43.3	5,982,475	76.3	1,397,775	4.28
3rd Quarter	*16,927,118*	*79.9*	*1,081,767*	*73.1*	*694,478*	*50.5*	*18,703,363*	*77.8*	*1,424,475*	*13.13*
9 months	*55,628,230*	*88.4*	*3,361,266*	*76.5*	*2,856,949*	*70.0*	*61,846,445*	*86.6*	*1,585,806*	*39.00*
October	5,146,787	72.0	242,122	48.5	207,867	44.8	5,596,776	69.0	1,263,381	4.43
November	5,641,308	81.5	358,664	74.2	200,494	44.7	6,200,466	78.9	1,445,330	4.29
December	5,523,277	77.4	343,266	68.9	191,394	41.4	6,057,937	74.8	1,370,574	4.42
4th Quarter	*16,311,372*	*76.9*	*944,052*	*63.8*	*599,755*	*43.6*	*17,855,179*	*74.2*	*1,358,842*	*13.14*
2nd 6 months	*33,238,490*	*78.4*	*2,025,819*	*68.5*	*1,294,233*	*47.1*	*36,558,542*	*76.0*	*1,391,646*	*26.27*
Total	71,939,602	85.5	4,305,318	73.3	3,456,704	63.4	79,701,624	83.5	1,528,608	52.14

Note—The percentages of capacity operated are calculated on weekly capacities of 1,614,338 net tons open hearth, 112,658 net tons Bessemer and 104,640 net tons electric ingots and steel for castings, total 1,831,636 net tons; based on annual capacities as of January 1, 1945 as follows: Open hearth 84,171,590 net tons, Bessemer 5,874,000 net tons, Electric 5,455,890 net tons, total 95,501,480 net tons.

*Revised January through December, 1945.

YEAR 1946

Based on Reports by Companies which in 1945 made 97.6% of the Open Hearth, 100% of the Bessemer and 85.8% of the Electric Ingot and Steel for Castings Production

Period	Estimated Production—All Companies								Calculated weekly production, all companies (Net tons)	Number of weeks in month
	OPEN HEARTH		BESSEMER		ELECTRIC		TOTAL			
	Net tons	Percent of capacity	Net tons	Percent of capacity	Net tons	Percent of capacity	Net tons	Percent of capacity		
January	3,528,090	51.1	207,512	47.4	136,452	29.2	3,872,054	49.6	874,053	4.43
February	1,300,944	20.9	25,905	6.6	65,668	15.6	1,392,517	19.8	348,129	4.00
March	5,946,698	86.2	363,949	83.1	196,400	42.0	6,507,047	83.3	1,468,859	4.43
1st Quarter	*10,775,732*	*53.8*	*597,366*	*47.0*	*398,520*	*29.4*	*11,771,618*	*51.9*	*915,367*	*12.86*
April	5,333,139	79.8	286,088	67.5	241,031	53.3	5,860,258	77.5	1,366,028	4.29
* May	3,699,979	53.6	153,409	35.0	219,064	46.9	4,072,452	52.2	919,289	4.43
† June	5,182,597	77.5	251,253	59.2	226,536	50.1	5,660,386	74.9	1,319,437	4.29
† *2nd Quarter*	*14,215,715*	*70.1*	*690,750*	*53.7*	*686,631*	*50.0*	*15,593,096*	*68.0*	*1,198,547*	*13.01*
† *1st 6 months*	*24,991,447*	*62.0*	*1,288,116*	*50.4*	*1,085,151*	*39.8*	*27,364,714*	*60.0*	*1,057,778*	*25.87*
July										4.42
August										4.43
September										4.28
3rd Quarter										*13.13*
9 months										*39.00*
October										4.43
November										4.29
December										4.42
4th Quarter										*13.14*
2nd 6 months										*26.27*
Total										52.14

Note—The percentages of capacity operated are calculated on weekly capacities of 1,558,041 net tons open hearth, 98,849 net tons Bessemer and 105,491 net tons electric ingots and steel for castings, total 1,762,381 net tons; based on annual capacities as of January 1, 1946 as follows: Open hearth 81,236,250 net tons, Bessemer 5,154,000 net tons, Electric 5,500,290 net tons, total 91,890,540 net tons.

*Revised.
†Preliminary figures, subject to revision.

Industrial Briefs . . .

• NEW FOUNDRY — Castalloy Co., Inc., of Cambridge, Mass., has recently put into operation a new foundry designed and built expressly for making aluminum or magnesium permanent mold castings. The new foundry, located at 363 Third St., Cambridge, is equipped to handle volume production.

• NEW WAREHOUSE—Peter A. Frasse & Co., Inc., has announced the opening of a new steel warehouse at 157 Richmond Ave., Syracuse, N. Y. The new warehouse will serve as a distributing point for mechanical steels to central New York. William E. Karnuth has been appointed district sales manager in charge.

• BUYS VICTOR CO.—The outright purchase of the Victor Animatograph Corp. of Davenport, Iowa, by the Curtiss-Wright Corp. has been announced. There will be no change in the location, personnel or operation of the Victor Co.

• NEW ENAMELING PLANT — Construction of a porcelain enameling plant has just been completed for the American Central Mfg. Corp., Connersville, Ind. This midwestern manufacturing firm is turning out all-steel American kitchens in greater increasing numbers.

• INCREASES FACILITIES — The Eureka Iron Works, a newly established division of the Eureka Shipbuilding Corp., is now prepared to fabricate and erect any type of steel construction, according to Milton Blackstone, president.

• NEW CONTRACT—A new contract has been signed by the Conlon Corp., Chicago to manufacture "Wizard" household washers and ironers for the Western Auto Supply Co. According to I. N. Merritt, vice-president of Conlon, and general manager, the contract calls for a large minimum unit requirement of both appliances made to Western Auto specifications.

• APPOINTED DEALER — Joseph Monahan, 351 Indiana Ave., NW, Grand Rapids, has been appointed franchised dealer or representative for western and northwestern Michigan, for Denison Engineering Co., Columbus, makers of HydrOILic equipment, including the Multipress.

• NEW PRODUCTS — Manufacture of a series of peacetime products is planned by the Monsanto Chemical Co. who have announced the lease of a government-owned chemical warfare service plant at Monsanto, Ill. Approximately $1 million will be spent on alterations and additions to the plant where an estimated several hundred workers will be employed in the manufacture of products which have been under research study or process development.

• NEW COMPANY — Albert M. Leising is president of the newly-organized Leising Bros. Corp., building contractors. The company will have headquarters in the building formerly occupied by the Sowers Mfg. Co., 1302 Niagara St., Buffalo.

• ACQUISITION—Ecko Products Co. has acquired Murdoch Metal Products, Inc., formerly M & M Mfg. Co. Murdoch Metal will be continued as a wholly owned subsidiary of Ecko Products, but sales of Murdoch products will be taken over by the Ecko merchandising organization.

• BUYS STEEL WAREHOUSE — Follansbee Metal Warehouses, a division of Follansbee Steel Corp., has purchased the steel warehouse facilities of Williamson Brothers Co., Fairfield (Bridgeport) Conn. This extension of service into New England will be in addition to warehouses presently operated by Follansbee Metal Warehouses at Rochester, N. Y., and Pittsburgh.

New Firm Sets Up To Manufacture Clad Metal

Pittsburgh

• • • **American Cladmetals Co.** has announced intention of producing cladmetals and fabricating a portion of them into cooking utensils at a plant in Rosslyn Farms, near Carnegie, Pa. This plant was formerly owned by Bethlehem Steel Co.

The company has filed a registration statement with the SEC providing for the sale of securities. Proceeds of the sale of securities will be devoted largely to the purchase and installation of cladding, rolling and fabricating equipment at the plant, and to provide working capital.

The company intends to clad stainless steel to an interlayer of copper, to make stainless clad copper sheets 0.01 to 1 in. thick and initially up to 30 in. wide.

Equipment to be installed in the plant is estimated to have an initial capacity of 4,000,000 lb of clad copper per yr, of which it is expected the fabricating dept. will consume 25 pct. The remainder would be sold to other fabricators.

SKF President Honored

Philadelphia

• • • **William L. Batt,** president of SKF Industries, Inc., of Philadelphia, has been made an honorary companion of the Order of St. Michael and St. George by King George VI in recognition for his wartime work as a member of the Combined Production & Resources Board, composed of representatives of the U. S., Canada and Great Britain.

Announcement of the award to Mr. Batt was made in Ottawa by the Canadian Secretary of State.

In addition to serving on the international board, the SKF president also served from 1940 to 1946 as vice-chairman of the U. S. War Production Board. He attended several conferences which determined Allied strategy and was charged with implementing many decisions taken by the chiefs of the Allied nations. He also served on the special mission to Russia which visited Moscow early in the war to arrange for lend-lease shipments to the Eastern front.

Construction Steel...

Chicago

• • • **The activity in** the structural field is very slow. Fabricators through bitter experience in the past few months trying to obtain material for different projects have decided it is better not to solicit business. The freeze on building projects by CPA is now being felt. What activity there is in the market is of very light construction with very light sections. Companies planning additions in plant buildings are postponing contracts until materials become available. Steel is not the only bottleneck; acute shortages in brick and heating equipment have also contributed to the slowdown.

New York

• • • **Fabricated steel awards** this week included the following:

2650 **Tons,** Grand Coulee Dam, Wash., trashracks for right powerhouse, Bureau of Reclamation, Denver, Spec. 1291, to Joshua Hendy Iron Works.

1800 **Tons,** San Francisco, Concrete piers for inactive fleet berthing, Naval Shipyard, through Ben C. Gerwick, Inc., to Bethlehem Pacific Coast Steel Corp., San Francisco.

1428 **Tons,** Redding, Calif., Shasta Dam drum gates, Bureau of Reclamation, Denver, Spec. 1220, to American Bridge Co., Pittsburgh.

1218 **Tons,** Caddoa, Colo., taintor gate, John Martin Dam, U. S. Engineer Office, through Morrison-Knudsen Co., Inc., to American Bridge Co., Pittsburgh.

800 **Tons,** Bakersfield, Calif., power plant for Pacific Gas & Electric Co., to American Bridge Co., Pittsburgh, through Stone & Webster Engineering Corp., Boston.

687 **Tons,** Coram, Calif., Shasta Dam outlet gates, Bureau of Reclamation, Denver, Spec. 1253, to Joshua Hendy Iron Works.

600 **Tons,** Garfield, N. J., extension to spinning mill to American Bridge Co., Pittsburgh, through Stone & Webster Engineering Corp., Boston.

400 **Tons,** Placer County, Calif., bridge over North Fork, American River, Tahoe National Forest, Public Roads Administration, through Fred D. Kyle to Judson-Pacific-Murphy Corp.

350 **Tons,** Lincoln County, Ore., Fuller and Ojalla bridges over Siletz River, State Highway Commission, through Tom Lillebo, to Poole & McGonigle.

300 **Tons,** West Lynn, Mass., building 41D for General Electric Co., to American Bridge Co., Pittsburgh.

248 **Tons,** Columbia Falls, Mont., steel warehouse at Hungry Horse Dam, Bureau of Reclamation, Denver, Spec. 1249, to American Bridge Co., Pittsburgh.

215 **Tons,** Anderson Ranch Dam, Idaho, ring-follower gates, Bureau of Reclamation, Denver, Spec. 1221, to Goslin-Birmingham Mfg. Co.

200 **Tons,** Providence, R. I., warehouse for Associated Grocers of Rhode Island, to unnamed fabricator.

138 **Tons,** Redlands, Calif., Mill Creek bridge, California Div. of Highways, through Bent Construction Co., to Consolidated Steel Corp.

130 **Tons,** San Diego, overcrossing, route 77 at Friars Road, California Div. of Highways, through Fred D. Kyle Co., to National Iron Works.

100 **Tons,** West Lynn, Mass., building 40W for General Electric Co., to American Bridge Co., Pittsburgh.

• • • **Fabricated steel inquiries** this week included the following:

700 **Tons,** El Monte, Calif., new glass plant for Ball Bros. Co. of California, the Austin Co., general contractor.

635 **Tons,** Long Beach, Calif., transit shed, Pier A, Berth 5, Peter Kiewit Sons Co., Arcadia, general contractor.

600 **Tons,** Maine, bridges on state highway.

400 **Tons,** Everett, Mass., foundry addition, for General Electric Co.

150 **Tons,** Albany, Calif., addition to central office building, Southern California Telephone Co.

• • • **Reinforcing bar awards** this week included the following:

2500 **Tons,** San Francisco, concrete piers for inactive fleet berthing, Naval Shipyard, through Ben C. Gerwick, Inc., to Bethlehem Pacific Coast Steel Corp., San Francisco.

235 **Tons,** Lodi, Calif., three highway bridges, California Div. of Highways, through Fredrickson & Watson Construction Co., to Gilmore Fabricators.

133 **Tons,** San Jose, Calif., separation structure, California Div. of Highways, through Fredrickson & Watson Construction Co., to Gilmore Fabricators.

125 **Tons,** Marion County, Ore., bridge, North Santiam Highway, Public Roads Administration, through Kuckenberg Construction Co., to Soule Steel Co.

105 **Tons,** Fitchburg, Mass., state highway to Truscon Steel Co., Boston.

• • • **Reinforcing bar inquiries** this week included the following:

250 **Tons,** Kingman, Ariz., Bureau of Reclamation, Denver, Inv. 7321-A.

169 **Tons,** Mountain Home, Idaho, Bureau of Reclamation, Denver, Inv. 22,727-A.

134 **Tons,** Granby, Colo., Bureau of Reclamation, Denver, Inv. F-46,204-A.

100 **Tons,** King County, Wash., two bridges over Tye River, P.S.H. 15, Director of Highways, Olympia, bids open July 23.

• • • **Sheet piling inquiries** this week included the following:

500 **Tons,** Maine, state highway project.

• • • **Plate awards** this week included the following:

3700 **Tons,** Loveland, Colo., penstocks, U. S. Bureau of Reclamation, to Darby Products & Steel Plate Co., Kansas City.

• • • **Plate inquiries** this week included the following:

2400 **Tons,** Fort Peck, Mont., power house.
2000 **Tons,** State of Washington, tunnel lining.

Minister of Finance Announces Reduction In Canadian Tariffs

Ottawa

• • • **Canadian tariff** changes announced by J. L. Ilsley, Finance Minister in his budget address in the House of Commons were of minor importance. A number of the changes deal with items that were introduced last October and then withdrawn, but subsequently were passed by Order in Council. Thus several of the tariff changes already were in effect but now require the approval of Parliament. The following tariff changes are to some extent associated with the iron and steel industry.

Noiseless street car trucks for use at Fort William in filling special orders for new type cars for Toronto now enter Canada under the intermediate tariff at 10 pct instead of 30 pct. An Order in Council at the beginning of the year permitted these tariff reductions. These were permitted entries duty free some years ago.

Auxiliary driving control kits made in the United States for Ford cars and to permit disabled persons to drive now enter Canada free of duty against a former rate of 25 pct.

Air compressors for trackless trolleys now enter Canada free of duty.

Fluid drive couplings for installation on Oldsmobile and Chrysler cars are free.

Transmission assemblies (hydraulic or fluid couplings) used in heavy duty trucks come in free. This item first was introduced in 1945 and withdrawn.

Motor truck body parts to enable a new firm (Wilson Body Co. of Toronto) to do a special conversion job on standard chassis enter Canada free.

Tractor tire materials enter Canada free of duty when used in manufacture of certain farm implements. This item already has been covered by Order in Council.

Electric dry shaving machines include entry of parts as well as complete equipment. This item also permits Remington Rand to import steel balls duty free.

Metal bath tub stampings are now at a rate of 10 pct instead of 27½ pct intermediate, to permit Moffats and Alliance of Vancouver to import these stampings. This item already had been provided by Order in Council early this year.

Photographic cameras and equipment now enter Canada free instead of at 7 pct British preference; 25 pct intermediate and 30 pct general tariff.

Rough dies for making nails, bolts, screws, rivets, nuts, tacks to enter Canada free under the British preference, 10 pct under intermediate and 35 pct for general tariff.

MACHINE TOOLS

. . . News and Market Activities

Machine Tool Sales Trend Continues Mixed

• • • **Reports from major** segments of the machine tool industry showed a conflicting spread of new orders, thin and spotty in the Middle West and better in the East, which is expected to dovetail pretty well with June figures, showing shipments up and new orders down.

Highlight in the midwest market was the sale of Acme Machine Tool Co., Cincinnati, to a group of Cincinnati investors, headed by Philip Moscowitz, an official of Moscowitz Bros., dealers in iron and steel and nonferrous scrap.

Sidney G. Rose, president and general manager, Rose Brothers Co., was associated with Mr. Moscowitz in the transaction. This is the same group which acquired Cincinnati Planer Co. last February.

Mr. Moscowitz and Mr. Rose, both of whom were in the Cincinnati Planer Co. transaction, have been elected chairman of the board and treasurer, respectively, of the Acme Machine Tool Co.

The group acquired substantially all of the stock in Acme from the estate of the late B. B. Quillen, and C. H. M. Atkins. Mr. Quillen and Mr. Atkins were large stockholders in both Acme Machine Tool Co. and Cincinnati Planer Co., and Mr. Quillen was president of both at the time of his death.

Mr. Atkins was also an officer of both companies. In addition to Mr. Moscowitz and Mr. Rose, new officers of Acme Machine Tool are: Charles Meyers, president; George Langen, vice-president; Joseph H. Hoodin, secretary; Fred Winkelman, general sales manager and assistant to the president; Arnold Guenther, auditor and assistant treasurer, and William Balbach, assistant secretary.

Mr. Meyers has been president of the company and the new management has announced that business will be continued as usual.

While complaints about the slowness of War Assets Administration procedures continue to be frequently heard, WAA machines are moving at a slightly faster pace in a number of districts, including Cleveland and Detroit. Dealers and builders' representatives are frank to admit that relations, business and personal, have improved considerably in recent weeks, and cream of the machines in some districts is pretty well siphoned off. WAA is still doing a big machine tool business.

In the East, particularly, it is felt that the WAA offerings are beginning to lose some of their attractiveness; surplus tools being currently offered have been pretty thoroughly picked over.

In Cincinnati, an order-shipment situation prevails which is contrary to that in most production centers. Orders are a trifle ahead of shipments, which are being delayed to some extent because all the parts necessary, particularly electrical equipment, cannot be obtained in sufficient quantities. While the materials procurement situation shows modest improvement in the Cincinnati shops, it will be some weeks before the manufacturers will be receiving components at a satisfactory rate.

In Detroit, machine tool orders for the new Ford and Chevrolet are being placed but specific information is, as might be expected, difficult to get. On the dealer side, there has been no change in the price situation; no advances have been publicly announced and where contracts for future sales are written, escalator clauses are being included to protect the producer from price spirals.

Cancellations are not showing up in the alarming numbers of a few weeks ago, and while July sales are running ahead of June in some few isolated cases, this slight improvement falls far short of first quarter business. In the East, some producers reporting a slight improvement, feel that a turn in the market has possibly come, for July business to date not only involves tools for prompt shipment, but for August and September as well.

Present indications are that E. W. Bliss Co., Detroit, will report a net profit in the neighborhood of $375,000 for the three months ended June 30, more than offsetting the net loss of $135,909 reported for the first quarter. Third quarter sales are estimated at about a $6,000,000 level, a gain of about 50 pct over the $4,000,000 reported for the second quarter. Estimates place the sales total for 1946 around $21,000,000, or slightly less than one-half the 1942 volume, the company's all-time high, when sales totaled about $46,000,000.

Production is as high as current material shortages will allow, with deliveries of heavy machinery extended to about 11 months, as compared to four or six months normally. Bliss' order backlog totals $40,000,000, highest for any peacetime year, and represents a year and a half's production. Bliss' two foreign plants (Paris and Derby, England) are operating at a profit, although manpower shortages are holding the Paris plant to 20 pct of capacity and the Derby plant to about 35 pct of capacity.

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MDNA Studying Repair Specs for Used Tools

Chicago

• • • **General standards** to cover the condition of used machinery sold by dealers are being considered by special committees of the Machinery Dealers National Assn. Certified standards for rebuilding would be on a nation-wide basis. Such a system, it is believed, would eliminate all possible doubt in the mind of the purchaser of used machine tools that he would be buying equipment rebuilt and guaranteed to meet established standards.

One of the plans being considered is that a thoroughly equipped rebuilding shop would be constructed and established in each of the different areas. Machines would pass through the rebuilding shop, would be checked according to the established standards before shipped to the final user.

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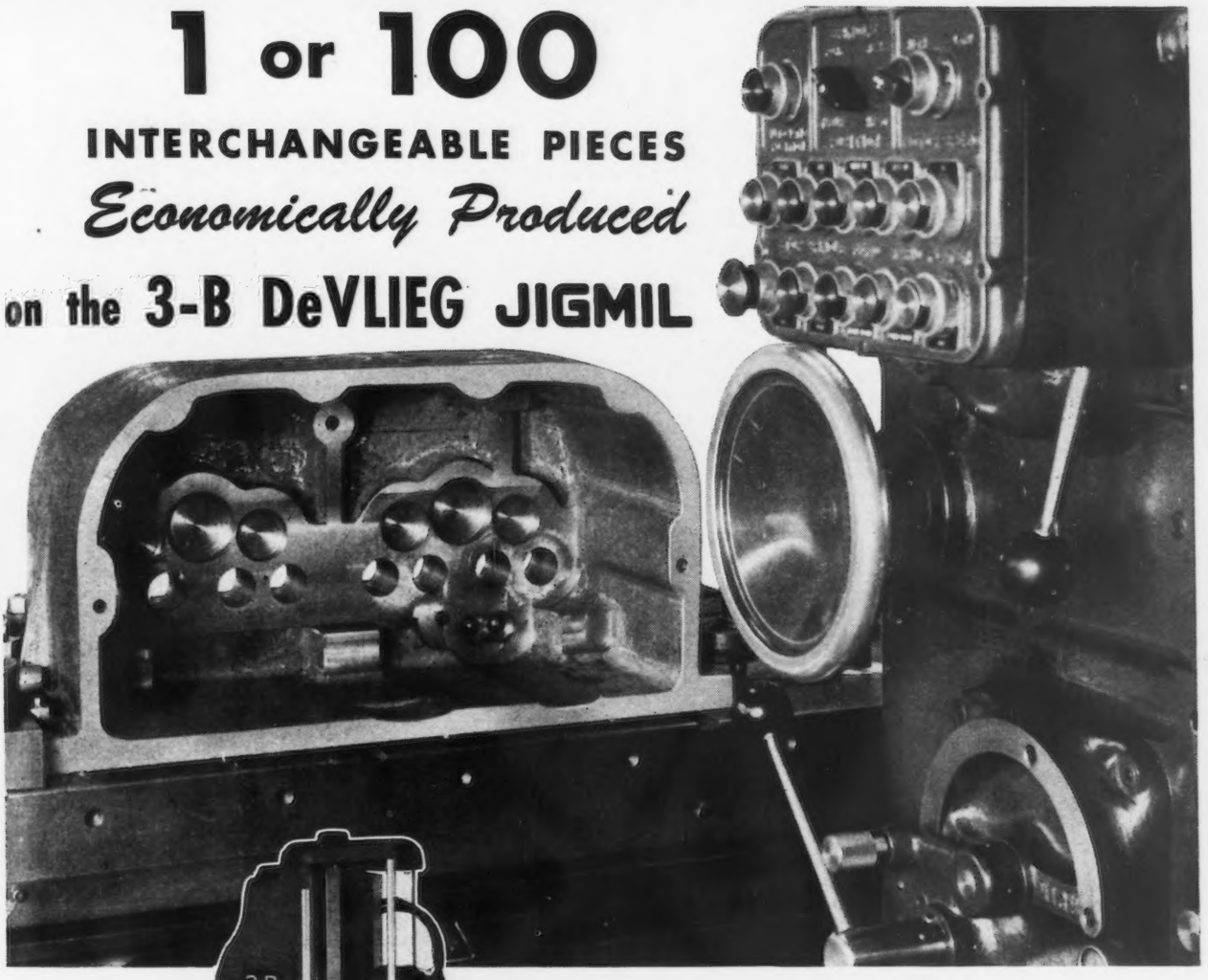

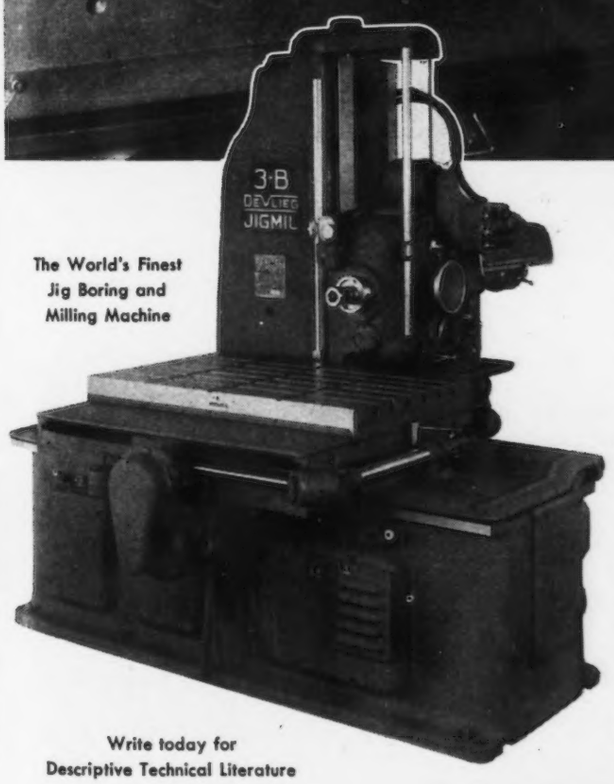

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DeVLIEG MACHINE COMPANY DEVLIEG JIGMIL **450 FAIR AVE. FERNDALE 20, (Detroit) MICH.**

NONFERROUS METALS

. . . News and Market Activities

Politicians Plan to Push Premium Price Plan With Subsidies by RFC

Washington

• • • **Knocked out by** the Presidential veto of the OPA extension bill, western Senators and Representatives are preparing to push through the premium price plan providing subsidies on copper, lead and zinc by transferring its administration to RFC. With this purpose in view, identical bills, one in the Senate and three in the House, have been reintroduced.

Except that functions of the quota committee and of CPA and OPA would be performed by RFC, the measures are largely similar to that which was incorporated in the OPA bill. Premiums up to $100 million would be authorized, and would be calculated on the basis of the monthly average price quotations in recognized trade journals in place of the prior basis of maximum prices. This operation would prevail even though OPA and ceilings were re-established since such ceilings would be quoted in trade journals. Provision is made, however, that the plan would be extended on terms not less favorable to the producer than heretofore. The measure also provides that (1) adjustments shall be made to encourage exploration and development work; (2) adequate allowances shall be made for depreciation and depletion; and (3) all classes of premiums shall be noncancellable unless necessary in order to make individual adjustments of income to specific mines.

The bill was introduced in the Senate by Senator McFarland, D., Ariz. Co-sponsors are Senator Murray, D., Mont., and Senator Hayden, D., Ariz. The House bills were introduced by Representatives Murdock and Harless, D., Ariz., and Representative Bunker, D., Nev.

•

Lead Mines Get Priorities

Washington

• • • **Designed to stimulate** domestic lead production, which was cut by more than 50 pct under the 1945 rate as the result of recent strikes, CPA has announced that lead mines and smelters may use priorities assistance to get capital equipment and materials for new development work. By amending Schedule 1 of PR-28 these mines and smelters may apply to CPA for CC ratings on orders for capital equipment, and materials for maintenance, repairs and operations. This priorities assistance will also be available for construction development work.

•

Aluminum Ingot, Scrap Up

Baltimore

• • • **Prices of aluminum** ingot and aluminum scrap have strengthened during the week. No. 12 foundry aluminum has increased by ¼¢ to a range of 11.50¢ to 12.00¢ per lb. Aluminum for deoxidizing has been increased by ½¢ to one cent per lb. The price for No. 2 is now 12.50¢, No. 3 is 11.50¢, No. 4 is 10.50¢. Segregated aluminum plant scrap prices have been increased by smelters to the following ranges: 2S solids, 8.50¢ to 9.00¢; Dural solids, 6.00¢ to 6.25¢; low copper solids, 8.00¢ to 8.50¢.

The action of smelters in raising ingot and scrap buying prices is due to the shortage of expected termination and military scrap which at the end of the war had been estimated at 3 billion lb. Actual tonnage realized is now estimated to have dropped to ½ billion lb. Relatively no production scrap is coming out and smelters are running on termination scrap which is being absorbed rapidly. Moreover aluminum fabricated products prices were increased several months ago.

•

Metals Scrap Over Ceiling

Baltimore

• • • **Dealers' prices for copper,** bronze and brass scrap have been increased above ceiling levels. Copper and bronze scrap is generally being bought at a cent above ceilings, brass scrap is generally being bought by dealers at ¾¢ above.

Dealers buying prices for zinc scrap is up about a cent with new zinc clippings and trimmings, engravers and lithographers plates being bought at 7½¢, old zinc scrap at 5¾¢.

Soft lead scrap is being bought at 7½¢ per lb.

•

To Get RFC Bauxite

Washington

• • • **Because of a** deficiency in commercial sources, bauxite from government stockpiles will be made available to the Reynolds Metals Co., it has been announced by OWMR Director John R. Steelman. Access to government stocks will be permitted only after the company has exhausted all possible means to obtain supplies from outside sources.

•

MR Copper Stock Low

• • • **Large producers** are allocating Metals Reserve supplies of copper to customers. There is a severe shortage of wire bars and the trade is under the impression that the MR stock is almost exhausted. It is estimated that it may be several months before the mines and refineries are operating at their normal capacity. Some labor has not returned to the producers and must be replaced with green personnel.

Nonferrous Metals Prices

cents per lb

	July 10	July 11	July 12	July 13	July 15	July 16
Copper, electro., Conn.	14.375	14.375	14.375	14.375	14.375	14.375
Copper, Lake, Conn.	14.375	14.375	14.375	14.375	14.375	14.375
Tin, Straits, New York	52.00	52.00	52.00	....	52.00	52.00
Zinc, East St. Louis	9.50	9.50	9.50	9.50	9.50	9.50
Lead, St. Louis	9.35	9.35	9.35	9.35	9.35	9.35

Primary Metals

(Cents per lb, unless otherwise noted)

Aluminum, 99+%, f.o.b. shipping point (min. 10,000 lb)	15.00
Aluminum pig, f.o.b. shipping point	14.00
Antimony, American, Laredo, Tex.	14.50
Beryllium copper, 3.75-4.25% Be; dollars per lb contained Be	$14.75
Beryllium aluminum, 5% Be; dollars per lb contained Be	$30.00
Cadmium, del'd	$1.25
Cobalt, 97-99% (per lb)	$1.50 to $1.57
Copper, electro, Conn. Valley	14.375
Copper, electro, New York	14.125
Copper, lake, Conn. Valley	14.375
Gold, U. S. Treas., dollars per oz.	$35.00
Indium, 99.8%, dollars per troy oz	$ 2.25
Iridium, dollars per troy oz.	$125.00
Lead, St. Louis	9.35
Lead, New York	9.50
Magnesium, 99.9 + %, carlots	20.50
Magnesium, 12-in. sticks, carlots	27.50
Mercury, dollars per 76-lb flask, f.o.b. New York	$100 to $102
Nickel, electro, f.o.b. refinery	35.00
Palladium, dollars per troy oz.	$24.00
Platinum, dollars per troy oz.	$70.00
Silver, New York, cents per oz.	90.125
Tin, Straits, New York	52.00
Zinc, East St. Louis	9.50
Zinc, New York	9.94
Zirconium copper, 6 pct Zr, per lb contained Zr	$ 6.00

Remelted Metals

(Cents per lb)

Aluminum, No. 12 Fdy. (No. 2)	11.50 to 12.00
Aluminum, deoxidizing	
No. 2	12.50
No. 3	11.50
No. 4	10.50
Brass Ingot—ceiling prices	
85-5-5-5 (No. 115)	15.50
88-10-2 (No. 215)	18.75
80-10-10 (No. 305)	18.25
No. 1 Yellow (No. 405)	12.50

Copper, Copper Base Alloys

(Mill base, cents per lb)

	Extruded shapes	Rods	Sheets
Copper	25.66	....	25.81
Copper, H.R.	....	22.16	....
Copper drawn	....	23.16	....
Low brass, 80%	....	24.35	24.66
High brass	....	....	24.38
Red brass, 85%	....	24.67	24.98
Naval brass	23.84	22.59	28.53
Brass, free cut	....	18.53	....
Commercial, bronze	....	25.50	25.81
Manganese bronze	27.45	25.95	32.03
Phosphor bronze, A, B, 5%	....	43.68	43.43
Muntz metal	23.59	22.34	26.78
Everdur, Herculoy, Olympic or equal	....	29.82	30.88
Nickel silver, 5%	....	34.44	32.38
Architectural bronze	22.50	....	....

Aluminum

(Cents per lb, base, subject to extras for quantity, gage, size, temper and finish)

Drawn tubing: 2 to 3 in. OD by 0.065 in. wall: 3S, 43.5¢, 52S-O, 67¢ 24S-T, 71¢: base, 30,000 lb.

Plate: ¼ in. and heavier: 2S, 3S, 21.2¢; 52S, 24.2¢: 61S, 23.8¢; 24S, 24S-AL, 24.2¢; 75S, 75S-AL, 30.5¢; base, 30,000 lb and over.

Flat Sheet: 0.136-in. thickness: 2S, 3S, 23.7¢; 52S, 27.2¢; 61S, 24.7¢; 24S-O, 24S-OAL, 26.7¢; 75S-O, 75S-OAL, 32.7¢; base, 30,000 lb and over.

Extruded Solid Shapes: factor determined by dividing the perimeter of the shape by its weight per foot. For factor 1 through 4, 3S, 26¢; 14S, 32.5¢; 24S, 35¢; 53S, 61S, 28¢; 63S, 27¢; 75S, 45.5¢: base, 30,000 lb.

Wire, Rod and Bar: screw machine stock, rounds, 17S-T, ¼ in., 29.5¢; ½ in., 27.5¢; 1 in., 26¢; 2 in., 24.5¢; hexagons, ¼ in., 35.5¢; ½ in., 30¢ 1 in., 2 in., 27¢: base, 5000 lb. *Rod:* 2S, 3S, 1¼ to 2½ in. diam, rolled, 23¢; cold-finished, 23.5¢ base, 30,000 lb. *Round Wire:* drawn, coiled, B & S gage 17-18: 2S, 3S, 33.5¢; 56S, 39.5¢; 10,000 lb base; B & S gage 00-1: 2S, 3S, 21¢; 56S, 30.5¢; B & S 15-16: 2S, 3S, 32.5¢; 56S, 38¢; base, 30,000 lb.

(Continued, See Next Column)

Magnesium

Sheet, rod, tubes, bars, extruded shapes subject to individual quotations. Metal turnings: 100 lb or more, 46¢ a lb; 25 to 90 lb, 56¢; less than 25 lb, 66¢.

NONFERROUS SCRAP METAL QUOTATIONS

Copper, Copper Base Alloys

OPA Group 1

No. 1 wire, No. 1 heavy copper	12.50
No. 1 tinned copper wire, No. 1 tinned heavy copper	12.50
No. 2 wire, mixed heavy copper	11.50
Copper tuyeres	11.50
Light copper	10.50
Copper borings, No. 1	12.50
No. 2 copper borings	11.50
Lead covered copper wire, cable	.. *
Lead covered telephone, power cable	.... *
Insulated copper	.... *

OPA Group 2

Bell metal	18.25
High grade bronze gears	16.00
High grade bronze solids	.... *
Low lead bronze borings	.... *
Babbitt lined brass bushings	15.75
High lead bronze solids	.... *
High lead bronze borings	.. *
Red trolley wheels	13.50
Tinny (phosphor bronze) borings	13.25
Tinny (phosphor bronze) solids	13.25
Copper-nickel solids and borings	12.00
Bronze paper mill wire cloth	12.25
Aluminum bronze solids	11.75
Soft red brass (No. 1 composition)	12.00
Soft red brass borings (No. 1)	12.00*
Gilding metal turnings	11.25
Contaminated gilded metal solids	11.25
Unlined standard red car boxes	11.00
Lined standard red car boxes	10.50
Cocks and faucets	10.50
Mixed brass screens	10.50
Red brass breakage	10.25
Old nickel silver solids	8.60
Old nickel silver borings	8.50
Copper lead solids, borings	7.75
Yellow brass castings	8.25
Automobile radiators	9.75
Zincy bronze solids, borings	10.75

OPA Group 3

Fired rifle shells	10.25
Brass pipe	10.50
Old rolled brass	9.00
Admiralty condenser tubes	9.50
Muntz metal condenser tubes	9.00
Plated brass sheet, pipe reflectors	8.50
Manganese bronze solids	8.75[1]
Manganese bronze solids	7.75[2]
Manganese bronze borings	8.00

OPA Group 4

Refinery brass	6.75*

*Price varies with analysis. [1] Lead content 0.00 to 0.40 pct. [2] Lead content 0.41 to 1.00 pct.

Brass Mill Scrap

Briquetted cartridge brass turnings	10.375
Cartridge brass turnings, loose	9.625
Loose yellow brass trimmings	9.625

Aluminum

Plant scrap, segregated

2S solids	8.50 to 9.00
Dural alloys, solids 14, 17, 18, 24S, 25S	6.00 to 6.25
turnings, dry basis	1.50 to 1.75
Low copper, alloys 51, 52, 61, 63S solids	8.00 to 8.50
turnings, dry basis	5.00 to 6.50

Plant scrap, mixed

Solids	4.25 to 4.50
Turnings, dry basis	1.50 to 1.75

Obsolete scrap

Pure cable	6.50 to 7.50
Old sheet and utensils	5.00 to 5.50
Old castings and forgings	5.00 to 5.50
Pistons, free of struts	4.00 to 4.50
Pistons, with struts	2.50 to 3.00
Old alloy sheet	2.00 to 2.50

Magnesium*

Segregated plant scrap

Pure solids and all other solids, exempt	
Borings and turnings	1.50

Mixed, contaminated plant scrap

Grade 1 solids	3.00
Grade 1 borings and turnings	2.00
Grade 2 solids	2.00
Grade 2 borings and turnings	1.00

*Nominal.

Zinc

New zinc clippings, trimmings	7.50
Engravers, lithographers plates	7.50
Old zinc scrap	5.75
Unsweated zinc dross	6.00
Die cast slab	5.50
New die cast scrap	5.45
Radiator grilles, old and new	4.50
Old die cast scrap	4.00

Lead

Deduct 1.40¢ a lb from refined metal basing point prices for refinery charge on used battery plates.

Soft lead scrap	7.50

Nickel

Ni content 98+%, Cu under ½%, 23¢ per lb; 90 to 98% Ni, 23¢ per lb contained Ni.

ELECTROPLATING ANODES AND CHEMICALS

Anodes

(Cents per lb, f.o.b. shipping point in 500 lb lots)

Copper, frt. allowed	
Cast, oval, 15 in. or longer	29.75
Electrodeposited	23.47
Rolled, oval, straight	23.97
Curved, 18 in. or longer	23.97
Brass, 80-20, frt allowed	
Cast, oval, 15 in. or longer	27.25
Zinc, cast, 99.99, 15 in. or longer	16¼
Nickel, 99 pct plus, frt allowed	
Cast	47
Rolled, depolarized	48
Silver, 999 fine	
Rolled, 100 oz. lots, per oz.	80¾

Chemicals

(Cents per lb, f.o.b. shipping point)

Copper cyanide, 1-5 bbls	34.00
Copper sulphate, 99.5, crystals, bbls	7.75
Nickel salts, single, 425 lb bbls, frt allowed	13.50
Silver cyanide, 100 oz lots, per oz.	0.655
Sodium cyanide, 96 pct, domestic, 100 lb drums	15.00
Zinc cyanide, 100 lb drums	33.00
Zinc sulphate, 89 pct, crystals, bbls, frt allowed	6.35

SCRAP

. . . News and Market Activities

Critical Supply Duplicates Wartime Crises

New York

• • • **The scrap market** here this week duplicated a number of similar wartime crises with the added handicap of a clouded price picture. The Civilian Production Administration added its voice to that of the Iron & Steel Institute with the statement that steel plants have at best a 2-weeks' supply of scrap on hand.

All major factors continued to hold the price line though observers here are agreed that some normal scrap sources are holding back supplies awaiting higher prices. Meanwhile steel industry representatives are reported to have decided to close down furnaces rather than break the price front and the Scrap Institute is meeting this week to sound out members' viewpoints.

An additional page of scrap news appears on p. **104.**

Were it not for the seriousness of the situation observers might be amused at the sudden burst of publicity given to a condition which has existed for many weeks and which has been rather well publicized in industry circles.

First signs of a break in the foundry scrap price front are appearing in the cast grades, with foundries desperately bidding $30 and even $35 in isolated cases to keep their plants open.

•

PITTSBURGH—The "Hold the Line" agreement reached by steel consumers at the meeting of the scrap committee of the American Iron & Steel Institute last week in Cleveland is expected to clarify the price situation and perhaps bring out a little more scrap. It is now understood clearly that consumers will not tolerate price increases, and the scrap industry, jittery because it has not known what would happen in prices, is somewhat better satisfied with a clear cut knowledge of what policy is and will be. Shipments are moving on old contracts on schedule, but mills are having difficulty in placing new contracts. Cast grades of scrap are extremely short, causing difficulties in the foundry trade.

•

CHICAGO—Supplies of scrap remain very low and quality is falling off. Consumers so far have been successful in their hold the line policy and are obtaining good cooperation from the rest of the industry. Inventories are generally bad but it is not likely that openhearth operation will be immediately affected as producers report they are just holding their own. The best indication of the dire need of the industry for scrap is the extension of special freight rates until December for such material from the West Coast. Contracts on new listings have not been completed. Unless there is a drastic change of thought these lists will go at the old price.

•

PHILADELPHIA—There is practically no steel scrap moving in this area and mills are reported to be raising the roof about it. No furnaces have yet been closed down for lack of scrap although some mills are expected to withdraw some furnaces soon for a shortage of pig iron. Cast grades are reported to be selling at $25 on cars at Philadelphia or $28 delivered to the foundry. These transactions are handled between dealer and foundry, as is customary, and brokers are not involved. Dealers say that there is little scrap coming into dealers yards and there is the feeling that a price increase would not significantly affect the volume of scrap coming out.

•

DETROIT—The critical scrap situation in this area is becoming more confused as the status of OPA remains undetermined. There is considerable evidence that some dealers and industrial suppliers are withholding scrap from the market in substantial amounts, hoping to benefit by a future price rise. Meanwhile, steel companies and scrap brokers appear to be holding the price line and are awaiting with interest the outcome of the scrap institute meeting in Cleveland this week. A substantial percentage of the scrap moving through brokers is covered by directives received from scrap sources and this has had the effect in many instances of upsetting the specialized outlets for electric furnace scrap developed over a period of years.

•

BOSTON — Little is moving because little is available, costs of preparation are high and also there is the possibility of higher prices. Claim is made there are not 500 tons of cast available in the entire Boston area. A Rhode Island foundry canvassed yards in and about here, first offering $25 a ton for No. 1 machinery, then $30. Exactly 11 tons were obtained within the range of these prices. Another sale of 15 tons of second hand cotton machinery fetched $35 a ton. The cost as prepared scrap is problematical.

•

NEW YORK—Brokers are continuing to move small volumes of steel scrap at former ceiling prices and new contracts are being signed for small quantities only. Some dealers and railroads are holding fair quantities awaiting a resolution of the price question. Isolated sales of cast grades by dealers to foundries are reported at prices up to $30.

BUFFALO—New contracts for mill grades have been placed on a limited scale at OPA prices in the past week, but dealers are in doubt as to what these would mean if the market pushed through ceilings before deliveries were completed. Meanwhile, most plants are shipping at old prices. Revaluation of Canadian funds at par with the U. S. dollar has brought a renewal of inquiries from Dominion mills and foundries, reputedly at prices considerably above ceiling. Bids as high as $25 a ton shipping point for cast grades have been reported from Canadians, or $5 above the old maximum, but without takers.

•

ST. LOUIS — The small amount of scrap iron being offered in this area is still being sold at ceiling prices, the trade continuing to mark time until final disposition has been made of the OPA. Because of the light receipts fabricating yards have made sharp cuts in labor forces. Open hearth users are still comfortably situated as to inventories but foundries are beginning to need supplies.

•

CINCINNATI — Steel scrap brokers generally are attempting to hold to the OPA levels, pending the completion of a decision on further governmental control. There is a feeling that some scrap is still being held out of the market because of unsettled conditions, with some stock moving on a price-to-be-determined basis. Supply continues to be very light, with both mills and foundries clamoring for good material.

•

CLEVELAND—While major consumers are continuing to hold the OPA price line, a good deal of up-grading, particularly in the direction of item 14, is going on. Shipments are slightly improved in some cases, possibly because some of the dealers have run out of patience. Mill inventories are down, though not yet critical, but if the present situation continues for another two weeks, some curtailment of production by major consumers can be expected.

•

BIRMINGHAM—Activity in this market is close to a standstill. Shipments dropped off when OPA refused the request for a price increase in June and no pickup is expected until dealers are able to get higher prices. The only current offers being made by consumers are on the basis of OPA ceilings.

•

TORONTO—A state of listlessness has developed in the Canadian scrap iron and steel markets which is due to shortage of materials rather than in any slackening in demand. Receipts are in small volume and are barely sufficient to meet 50 pct of consumer requirements. Steel mills have only small inventories of scrap on hand, and dealers' yard stocks are negligible. Iron scrap materials are scarce and foundries are unable to obtain enough cast or stove plate for daily needs.

IRON AND STEEL SCRAP PRICES

Going prices as obtained in the trade by IRON AGE editors, based on representative tonnages. Where asterisks are used they indicate the former ceiling price to which must be added brokerage fee and adjusted freight.

PITTSBURGH

Per gross ton delivered to consumer:

No. 1 hvy. melting	$20.00*
RR. hvy. melting	21.00*
No. 2 hvy. melting	20.00*
RR. scrap rails	21.50*
Rails 3 ft. and under	23.50*
No. 1 comp'd sheets	20.00*
Hand bdld. new shts.	20.00*
Hvy. axle turn.	19.50*
Hvy. steel forge turn.	19.50*
Mach. shop turn.	15.00*
Short shov. turn.	17.00*
Mixed bor. and turn.	15.00*
Cast iron borings	16.00*
Hvy. break cast.	16.50*
No. 1 cupola	20.00*
RR. knuck. and coup.	24.50*
RR. coil springs	24.50*
Rail leaf springs	24.50*
Rolled steel wheels	24.50*
Low phos. bil. crops	25.00*
Low phos.	22.50*
RR. malleable	22.00*

CHICAGO

Per gross ton delivered to consumer:

No. 1 hvy. melting	$18.75*
No. 2 hvy. melting	18.75*
No. 1 bundles	18.75*
No. 2 dealers' bndls.	18.75*
Bundled mach. shop turn.	18.75*
Galv. bundles	16.75*
Mach. shop turn.	13.75*
Short shovels, turn.	15.75*
Cast iron borings	14.75*
Mix. borings & turn.	13.75*
Low phos. hvy. forge	23.75*
Low phos. plates	21.25*
No. 1 RR. hvy. melt.	19.75*
Reroll rails	22.25*
Miscellaneous rails	20.25*
Angles & splice bars	22.25*
Locomotive tires, cut	24.25*
Cut bolsters & side frames	22.25*
Standard stl. car axles	25.75*
No. 3 steel wheels	23.25*
Couplers & knuckles	23.25*
Agricul. malleable	22.00*
RR. malleable	22.00*
No. 1 mach. cast.	20.00*
Rails 3 ft. and under	22.25*
No. 1 agricul. cast.	20.00*
Hvy. breakable cast.	16.50*
RR. grate bars	15.25*
Cast iron brake shoes	15.25*
Stove plate	19.00*
Clean auto cast.	20.00*
Cast iron carwheels	20.00*

CINCINNATI

Per gross ton delivered to consumer:

No. 1 hvy. melting	$19.50*
No. 2 hvy. melting	19.50*
No. 1 bundles	19.50*
No. 2 bundles	19.50*
Mach. shop turn.	$10.50 to 11.00
Shoveling turn.	12.50 to 13.00
Cast iron borings	11.50 to 12.00
Mixed bor. & turn.	11.50 to 12.00
Low phos. plate	22.00*
No. 1 cupola cast.	20.00*
Hvy. breakable cast.	16.50*
Stove plate	19.00*
Scrap rails	21.00*

BOSTON

Dealers' buying prices per gross ton, f.o.b. cars

No. 1 hvy. melting	$15.05*
No. 2 hvy. melting	15.05*
Nos. 1 and 2 bundles	15.05*
Busheling	15.05*
Turnings, shovelings	12.05*
Machine shop turn.	10.05*
Mixed bor. & turn.	10.05*
Cl'n cast, chem. bor.	$13.06 to 14.15*
Machinery Cast.	20.00*
Breakable cast.	16.50*
Stove plate	19.00*

DETROIT

Per gross ton, brokers' buying prices:

No. 1 hvy. melting	$17.32*
No. 2 hvy. melting	17.32*
No. 1 bundles	17.32*
New busheling	17.32*
Flashings	17.32*
Mach. shop turn.	12.32*
Short shov. turn.	14.32*
Cast iron borings	13.32*
Mixed bor. & turn.	12.32*
Low phos. plate	19.82*
No. 1 cupola cast.	20.00*
Charging box cast.	19.00*
Hvy. breakable cast.	16.50*
Stove plate	19.00*
Automotive cast.	20.00*

PHILADELPHIA

Per gross ton delivered to consumer:

No. 1 hvy. melting	$18.75*
No. 2 hvy. melting	18.75*
No. 2 bundles	18.75*
Mach. shop turn.	13.75*
Shoveling turn.	15.75*
Cast iron borings	14.75*
Mixed bor. & turn.	13.75*
No. 1 cupola cast.	20.00*
Hvy. breakable cast.	16.50*
Cast, charging box	19.00*
Hvy. axle forge turn.	18.25*
Low phos. plate	21.25*
Low phos. punchings	21.25*
Billet crops	21.25*
RR. steel wheels	23.25*
RR. coil springs	23.25*
RR. malleable	22.00*

ST. LOUIS

Per gross ton delivered to consumer:

Heavy melting	$17.50*
Bundled sheets	17.50*
Mach. shop turn.	12.50*
Locomotive tires, uncut	$18.50 to 19.00
Misc. std. sec. rails	19.00*
Rerolling rails	21.00*
Steel angle bars	21.00*
Rails 3 ft and under	21.50*
RR. springs	22.00*
Steel car axles	24.50*
Stove plate	19.00*
Grate bars	15.25*
Brake shoes	15.25*
RR. malleable	22.00*
Cast iron carwheels	20.00*
No. 1 mach'ery cast	20.00*
Breakable cast.	16.50*

BIRMINGHAM

Per gross ton delivered to consumer:

No. 1 hvy. melting	$17.00*
No. 2 hvy. melting	17.00*
No. 2 bundles	17.00*
No. 1 busheling	17.00*
Long turnings	12.00*
Shoveling turnings	14.00*
Cast iron borings	13.00*
Bar crops and plate	$18.50 to 19.50*
Structural and plate	18.50 to 19.50*
No. 1 cast	20.00*
Stove plate	19.00*
Steel axles	18.50*
Scrap rails	18.50
Rerolling rails	20.50*
Angles & splice bars	20.50 to 21.00
Rails 3 ft. & under	21.00*
Cast iron carwheels	17.50 to 18.00

YOUNGSTOWN

Per gross ton delivered to consumer:

No. 1 hvy. melting	$20.00*
No. 2 hvy. melting	20.00*
Low phos. plate	22.50*
No. 1 busheling	20.00*
Hydraulic bundles	20.00*
Mach. shop turn.	15.00*
Short shovel. turn.	17.00*
Cast iron borings	16.00*

NEW YORK

Brokers' buying prices per gross ton, on cars:

No. 1 hvy. melting	$15.33*
No. 2 hvy. melting	15.33*
Comp. black bundles	15.33*
Comp. galv. bundles	13.33*
Mach. shop turn.	10.33*
Mixed bor. & turn.	10.33*
Shoveling turn.	12.33*
No. 1 cupola cast	20.00*
Hvy. breakable cast	16.50*
Charging box cast	19.00*
Stove plate	19.00*
Clean auto cast	20.00*
Unstrip. motor blks.	17.50*
Cl'n chem. cast bor.	14.33*

BUFFALO

Per gross ton delivered to consumer:

No. 1 hvy. melting	$19.25*
No. 1 bundles	19.25*
No. 2 bundles	19.25*
No. 2 hvy. melting	19.25*
Mach. shop turn.	14.25*
Shoveling turn.	16.25*
Cast iron borings	14.25*
Cast iron borings	15.25*
Mixed bor. & turn.	14.25*
Stove plate	19.00*
Low phos. plate	21.75*
Scrap rails	20.75*
Rails 3 ft. & under	22.75*
RR. steel wheels	23.75*
Cast iron car wheels	20.00*
RR. coil & leaf spgs.	23.75*
RR. knuckles & coup.	23.75*
RR. malleable	22.00*
No. 1 busheling	19.25*

CLEVELAND

Per gross ton delivered to consumer:

No. 1 hvy. melting	$19.50*
No. 2 hvy. melting	19.50*
Compressed sheet stl.	19.50*
Drop forge flashings	19.00
No. 2 bundles	19.50*
Mach. shop turn.	14.50*
Short shovel.	16.50*
No. 1 busheling	19.50*
Steel axle turn.	19.00*
Low phos. billet and bloom crops	24.50*
Cast iron borings	15.50*
Mixed bor. & turn.	14.50*
No. 2 busheling	17.00*
No. 1 machine cast	20.00*
Railroad cast	20.00*
Railroad grate bars	15.25*
Stove plate	19.00*
RR. hvy. melting	20.50*
Rails 3 ft. & under	23.00*
Rails 18 in. & under	24.25*
Rails for rerolling	23.00*
Railroad malleable	22.00*
Elec. furnace punch	22.00*

SAN FRANCISCO

Per gross ton delivered to consumer:

RR. hvy. melting	$18.00*
No. 1 hvy. melting	17.00*
No. 2 hvy. melting	17.00*
No. 2 bales	$15.00 to 15.75
No. 3 bales	8.50 to 9.25
Mach. shop turn.	6.50 to 7.25
Elec. furn. 1 ft. und.	15.50 to 17.00
No. 1 cupola cast	19.00 to 21.00

LOS ANGELES

Per gross ton delivered to consumer:

No. 1 hvy. melting	$17.00
No. 2 hvy. melting	17.00
No. 1 bales	$16.00 to 17.00
No. 2 bales	15.50 to 16.00
No. 3 bales	8.00 to 9.00
Mach. shop turn.	7.00
No. 1 cupola cast	19.00 to 21.00

SEATTLE

Per gross ton delivered to consumer:

RR. hvy. melting	$14.50*
No. 1 & No. 2 hvy. melting	14.50*
Elec. furn. 1 ft. und.	$14.00 to 15.00
No. 1 cupola cast	20.00*

HAMILTON, ONT.

Per gross ton delivered to consumer:

Heavy melting	$17.50*
No. 1 bundles	17.50*
No. 2 bundles	17.00*
Mixed steel scrap	15.50*
Rails, remelting	18.50*
Rails, rerolling	21.50*
Bushelings	13.00*
Mixed borings & turnings	12.50*
Electric furnace bundles	20.50*
Manganese steel scrap	20.00*
No. 1 cast	19.00*
Stove plate	17.50*
Car wheels, cast	19.50*
Malleable iron	16.00*

Comparison of Prices . .

Advances over past week in **Heavy Type**; declines in *Italics*. Prices are f.o.b. major basing points. The various basing points for finished and semifinished steel are listed in the detailed price tables.

Flat-Rolled Steel: (cents per pound)	July 16, 1946	July 9, 1946	June 11, 1946	July 17, 1945
Hot-rolled sheets	2.425	2.425	2.425	2.20
Cold-rolled sheets	3.275	3.275	3.275	3.05
Galvanized sheets (24 ga.)	4.05	4.05	4.05	3.70
Hot-rolled strip				
6-in. and under	2.45	2.45	2.45	2.10
Over 6 in.	2.35	2.35	2.35	2.10
Cold-rolled strip	3.05	3.05	3.05	2.80
Plates	2.50	2.50	2.50	2.25
Plates, wrought iron	4.112	4.112	4.112	3.80
Stain's c-r strip (No. 302)	30.30	30.30	30.30	28.00
Tin and Terneplate: (dollars per base box)				
Tinplate, standard cokes.	$5.00	$5.00	$5.00	$5.00
Tinplate, electro (0.50 lb)	4.50	4.50	4.50	4.50
Special coated mfg. ternes	4.55	4.55	4.55	4.30
Bars and Shapes: (cents per pound)				
Merchant bars	2.50	2.50	2.50	2.25
Cold-finished bars	3.10	3.10	3.10	2.65
Alloy bars	2.92	2.92	2.92	2.70
Structural shapes	2.35	2.35	2.35	2.10
Stainless bars (No. 302).	25.97	25.97	25.97	24.00
Wrought iron bars	4.76	4.76	4.76	4.40
Wire and Wire Products: (cents per pound)				
Bright wire	3.05	3.05	3.05	2.75
Wire nails	3.75	3.75	3.25	2.90
Rails: (dollars per net ton)				
Heavy rails	$43.39	$43.39	$43.39	$43.00
Light rails	49.18	49.18	49.18	45.00
Semifinished Steel: (dollars per gross ton)				
Rerolling billets	$39.00	$39.00	$39.00	$36.00
Sheet bars	38.00	38.00	38.00	36.00
Slabs, rerolling	39.00	39.00	39.00	36.00
Forging billets	47.00	47.00	47.00	42.00
Alloy blooms, billets, slabs	58.43	58.43	58.43	54.00
Wire Rods and Skelp: (cents per pound)				
Wire rods	2.30	2.30	2.30	2.15
Skelp	2.05	2.05	2.05	1.90

Pig Iron*: (per gross ton)	July 16, 1946	July 9, 1946	June 11, 1946	July 17, 1945
No. 2 foundry, Phila.	$28.34	$28.34	$28.34	$26.84
No. 2, Valley furnace	26.50	26.50	26.50	25.00
No. 2, Southern, Cin'ti	28.94	28.94	26.94	25.44
No. 2, Birmingham	24.88	24.88	22.88	21.38
No. 2 foundry, Chicago†	26.50	26.50	26.50	25.00
Basic, del'd eastern Pa.	27.84	27.84	27.84	26.34
Basic, Valley furnace	26.00	26.00	26.00	24.50
Malleable, Chicago†	26.50	26.50	26.50	25.00
Malleable, Valley	26.50	26.50	26.50	25.00
L. S. charcoal, Chicago	42.34	42.34	42.34	42.34
Ferromanganese‡	135.00	135.00	135.00	135.00

† The switching charge for delivery to foundries in the Chicago district is 60¢ per ton.
‡ For carlots at seaboard.
*Subject to retroactive adjustment.

Scrap: (per gross ton)				
Heavy melt'g steel, P'gh.	$20.00	$20.00	$20.00	$20.00
Heavy melt'g steel, Phila.	18.75	18.75	18.75	18.75
Heavy melt'g steel, Ch'go	18.75	18.75	18.75	18.75
No. 1 hy. comp. sheet, Det.	17.32	17.32	17.32	17.32
Low phos. plate, Youngs'n	22.50	22.50	22.50	22.50
No. 1 cast, Pittsburgh	20.00	20.00	20.00	20.00
No. 1 cast, Philadelphia.	20.00	20.00	20.00	20.00
No. 1 cast, Chicago	20.00	20.00	20.00	20.00
Coke, Connellsville: (per net ton at oven)				
Furnace coke, prompt	$8.75	$7.50	$7.50	$7.50
Foundry coke, prompt	9.85	9.00	9.00	9.00
Nonferrous Metals: (cents per pound to large buyers)				
Copper, electro., Conn.	14.375	14.375	14.375	12.00
Copper, Lake, Conn.	14.375	14.375	14.375	12.00
Tin, Straits, New York	52.00	52.00	52.00	52.00
Zinc, East St. Louis	9.50	9.50	8.25	8.25
Lead, St. Louis	9.50	9.50	8.10	6.35
Aluminum, virgin	15.00	15.00	15.00	15.00
Nickel, electrolytic	35.00	35.00	35.00	35.00
Magnesium, ingot	20.50	20.50	20.50	20.50
Antimony, Laredo, Tex.	14.50	14.50	14.50	14.50

Composite Prices . .

Starting with the issue of Apr. 22, 1943, the weighted finished steel index was revised for the years 1941, 1942 and 1943. See explanation of the change on p. 90 of the Apr. 22, 1943, issue. Index revised to a quarterly basis as of Nov. 16, 1944; for details see p. 98 of that issue. The finished steel composite prices for the current quarter are an estimate based on finished steel shipments for the previous quarter. These figures will be revised when the actual data of shipments for this quarter are compiled.

	FINISHED STEEL	PIG IRON	SCRAP STEEL
July 16, 1946	2.72115¢ per lb.	$26.45 per gross ton.	$19.17 per gross ton.
One week ago	2.72115¢ per lb.	$26.45 per gross ton.	$19.17 per gross ton.
One month ago	2.72115¢ per lb.	$26.12 per gross ton.	$19.17 per gross ton.
One year ago	2.44076¢ per lb.	$24.61 per gross ton.	$19.17 per gross ton.

	FINISHED STEEL HIGH	FINISHED STEEL LOW	PIG IRON HIGH	PIG IRON LOW	SCRAP STEEL HIGH	SCRAP STEEL LOW
1946	2.72115¢ Apr. 2	2.54490¢ Jan. 1	$26.45 July 9	$25.37 Jan. 1	$19.17	$19.17
1945	2.44104¢ Oct. 2	2.38444¢ Jan. 2	25.37 Oct. 23	23.61 Jan. 2	$19.17 Jan. 2	$18.92 May 22
1944	2.30837¢ Sept. 5	2.21189¢ Oct. 5	$23.61	$23.61	19.17 Jan. 11	15.76 Oct. 24
1943	2.29176¢	2.29176¢	23.61	23.61	$19.17	$19.17
1942	2.28249¢	2.28249¢	23.61	23.61	19.17	19.17
1941	2.43078¢	2.43078¢	$23.61 Mar. 20	$23.45 Jan. 2	$22.00 Jan. 7	$19.17 Apr. 10
1940	2.30467¢ Jan. 2	2.24107¢ Apr. 16	23.45 Dec. 23	22.61 Jan. 2	21.83 Dec. 30	16.04 Apr. 9
1939	2.35367¢ Jan. 3	2.26689¢ May 16	22.61 Sept. 19	20.61 Sept. 12	22.50 Oct. 3	14.08 May 16
1938	2.58414¢ Jan. 4	2.27207¢ Oct. 18	23.25 June 21	19.61 July 6	15.00 Nov. 22	11.00 June 7
1937	2.58414¢ Mar. 9	2.32263¢ Jan. 4	23.25 Mar. 9	20.25 Feb. 16	21.92 Mar. 30	12.67 June 9
1936	2.32263¢ Dec. 28	2.05200¢ Mar. 10	19.74 Nov. 24	18.73 Aug. 11	17.75 Dec. 21	12.67 June 8
1935	2.07642¢ Oct. 1	2.06492¢ Jan. 8	18.84 Nov. 5	17.83 May 14	13.42 Dec. 10	10.33 Apr. 29
1934	2.15367¢ Apr. 24	1.95757¢ Jan. 2	17.90 May 1	16.90 Jan. 27	13.00 Mar. 13	9.50 Sept. 25
1933	1.95578¢ Oct. 3	1.75836¢ May 2	16.90 Dec. 5	13.56 Jan. 3	12.25 Aug. 8	6.75 Jan. 3
1932	1.89196¢ July 5	1.83901¢ Mar. 1	14.81 Jan. 5	13.56 Dec. 6	8.50 Jan. 12	6.43 July 5
1931	1.99626¢ Jan. 13	1.86586¢ Dec. 29	15.90 Jan. 6	14.79 Dec. 15	11.33 Jan. 6	8.50 Dec. 29
1930	2.25488¢ Jan. 7	1.97319¢ Dec. 9	18.21 Jan. 7	15.90 Dec. 16	15.00 Feb. 18	11.25 Dec. 9
1929	2.31773¢ May 28	2.26498¢ Oct. 29	18.71 May 14	18.21 Dec. 17	17.58 Jan. 29	14.08 Dec. 3

Weighted index based on steel bars, shapes, plates, wire, rails, black pipe, hot and cold-rolled sheets and strip, representing 78 pct of the United States output. Index recapitulated in Aug. 28, 1941, issue.

Based on averages for basic iron at Valley furnaces and foundry iron at Chicago, Philadelphia, Buffalo Valley and Birmingham.

Based on No. 1 heavy melting steel scrap quotations to consumers at Pittsburgh, Philadelphia and Chicago.

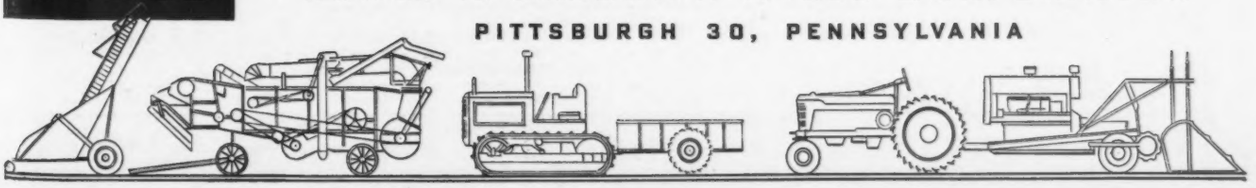
FARM COMBINE IN ACTION cutting grain, threshing it, elevating it to hopper bin to be placed in bags and picked up by truck. Many parts of Cold Finished steel are used in both tractors and combines, without which machinery today's great harvests would be impossible.

Experience and proper equipment are indispensable in the production of steels for cold working. At J&L the steel used in cold finishing operations is specially selected to be cold drawn, turned and ground, turned and polished or cold rolled. This is one reason why J&L Cold Finished steel is easy to machine, why you have fewer tool changes when making parts for agricultural implements, automobiles, home appliances and business machines. Write for information.

J&L STEEL

JONES & LAUGHLIN STEEL CORPORATION

PITTSBURGH 30, PENNSYLVANIA



Iron and Steel Prices . . .

Steel prices shown here are f.o.b. basing points, in cents per pound or dollars per gross ton. Extras apply. Delivered prices do not reflect 3 pct tax on freight. (1) Mill run sheet, 10¢ per 100 lb under base; primes, 25¢ above base. (2) Unassorted commercial coating. (3) Widths up to 12-in. inclusive. (4) 0.25 carbon and less. (5) Applies to certain width and length limitations. (6) For merchant trade. (7) For straight length material only from producer to consumer. Discount of 25¢ per 100 lb to fabricators. (8) Also shafting. For quantities of 20,000 lb to 39,999 lb. (9) Carload lot in manufacturing trade. (10) Prices do not apply if rail and water is not used. (11) Boxed. (12) This base price for annealed, bright finish wires, commercial spring wire. (13) Produced to dimensional tolerances in AISI Manual Sect. 6. (14) Billets only. (15) 9/32 in. to 47/64 in., 0.15¢ per lb higher.

Basing Points	Pittsburgh	Chicago	Gary	Cleveland	Birmingham	Buffalo	Youngstown	Sparrows Point	Granite City	Middletown, Ohio	Gulf Ports, Cars	10 Pacific Ports, Cars	DELIVERED TO Detroit	New York	Philadelphia
INGOTS															
Carbon, rerolling	($33.00 f. o. b. mill)														
Carbon, forging	$38	$38	$38	$38	$38	$38	$38								
Alloy	$48.69	$48.69				$48.69	(Bethlehem, Massillon, Canton, Coatesville=$48.69)								
BILLETS, BLOOMS, SLABS							(Provo=$50.20, Duluth=$41[14])								
Carbon, rerolling	$39	$39	$39	$39	$39	$39	$39	$39				$51[14]	$41		
Carbon, forging billets	$47	$47	$47	$47	$47	(Provo=$58.20, Duluth=$49[14]) $47	$47					$59[14]	$49		
Alloy	$58.43	$58.43				$58.43	(Bethlehem, Massillon, Canton=$58.43)						$60.59		
SHEET BARS	$38	$38		$38		$38	$38	$38	(Canton=$38)						
PIPE SKELP	2.05¢	2.05¢					2.05¢	2.05¢	(Coatesville=2.05¢)						
WIRE RODS [15]															
No. 5 to 9/32 in.	2.30¢	2.30¢		2.30¢	2.30¢		(Worcester=2.40¢)				2.55¢	2.80¢			
SHEETS															
Hot-rolled	2.425¢	2.425¢	2.425¢	2.425¢	2.425¢	2.425¢	2.425¢	2.425¢	2.525¢	2.425¢		2.975¢	2.525¢	2.685¢	2.615¢
Cold-rolled [1]	3.275¢	3.275¢	3.275¢	3.275¢		3.275¢	3.275¢		3.375¢	3.275¢		3.925¢	3.375¢	3.615¢	3.635¢
Galvanized (24 gage)	4.05¢	4.05¢	4.05¢		4.05¢	4.05¢	4.05¢	4.05¢	4.15¢	4.05¢		4.60¢		4.31¢	4.24¢
Enameling (20 gage)	3.80¢	3.80¢	3.80¢	3.80¢			3.80¢		3.90¢	3.80¢		4.45¢	3.90¢	4.20¢	4.16¢
Enameling (10 Gage)	3.20¢	3.20¢	3.20¢	3.20¢			3.20¢		3.30¢	3.20¢		3.85¢	3.30¢	3.60¢	3.56¢
Long ternes [2]	4.05¢	4.05¢	4.05¢									4.80¢		4.45¢	4.41¢
STRIP															
Hot-rolled [3] 6 in. and under	2.45¢	2.45¢	2.45¢	2.45¢	2.45¢		2.45¢			2.45¢		3.10¢	2.55¢	2.85¢	2.81¢
Hot-rolled [3] over 6 in.	2.35¢	2.35¢	2.35¢	2.35¢	2.35¢		2.35¢			2.35¢		3.00¢	2.45¢	2.75¢	2.71¢
Cold-rolled [4]	3.05¢	3.15¢		3.05¢			3.05¢	(Worcester=3.25¢)					3.15¢	3.45¢	3.41¢
Cooperage stock	2.55¢	2.55¢			2.55¢		2.55¢							2.95¢	
TINPLATE															
Standard cokes, base box	$5.00	$5.00	$5.00		$5.10			$5.10	$5.10					$5.375	$5.301
Electro, box 0.25 lb	$4.35	$4.35	$4.35					$4.35							
Electro, box 0.50 lb	$4.50	$4.50	$4.50					$4.60	$4.60						
Electro, box 0.75 lb	$4.65		$4.65					$4.75	$4.75						
BLACKPLATE															
29 gage [5]	3.30¢	3.30¢	3.30¢					3.40¢	3.40¢					3.66¢	3.59¢
TERNES, MFG.															
Special coated, base box	$4.55	$4.55	$4.55					$4.65	$4.65						
BARS								(Duluth=2.60¢)							
Carbon steel	2.50¢	2.50¢	2.50¢	2.50¢	2.50¢	2.50¢	2.50¢	(Provo, Utah=3.20¢)			2.85¢	3.15¢	2.60¢	2.84¢	2.88¢
Rail steel [6]	2.50¢	2.50¢	2.50¢	2.50¢	2.50¢	2.50¢					2.85¢	3.15¢			
Reinforcing (billet) [7]	2.35¢	2.35¢	2.35¢	2.35¢	2.35¢	2.35¢	2.35¢	2.35¢			2.70¢	2.75¢	2.45¢	2.61¢	2.69¢
Reinforcing (rail) [7]	2.35¢	2.35¢	2.35¢	2.35¢	2.35¢	2.35¢	2.35¢				2.70¢	2.75¢	2.45¢		
Cold-finished [8]	3.10¢	3.10¢	3.10¢	3.10¢		3.10¢	(Detroit=3.15¢)			(Toledo=3.25¢)				3.44¢	3.48¢
Alloy, hot-rolled	2.92¢	2.92¢				2.92¢	2.92¢	(Bethlehem, Massillon, Canton=2.92¢)					3.03¢		
Alloy, cold-drawn	3.62¢	3.62¢	3.62¢	3.62¢		3.62¢							3.73¢		
PLATE								(Coatesville and Claymont=2.50¢, Provo, Utah=3.20¢)							
Carbon steel [13]	2.50¢	2.50¢	2.50¢	2.50¢	2.50¢		2.50¢	2.50¢			2.85¢	3.05¢	2.72¢	2.71¢	2.553¢
Floor plates	3.75¢	3.75¢									4.10¢	4.40¢		4.15¢	4.15¢
Alloy	3.79¢	3.79¢			(Coatesville=3.79¢)						4.27¢	4.49¢		4.01¢	3.895¢
SHAPES															
Structural	2.35¢	2.35¢	2.35¢		2.35¢	2.35¢	(Bethlehem=2.35¢)				2.60¢	3.00¢		2.54¢	2.43¢
SPRING STEEL, C-R															
0.26 to 0.50 carbon	2.80¢			2.80¢			(Worcester=3.20¢)								
0.51 to 0.75 carbon	4.30¢			4.30¢			(Worcester=4.50¢)								
0.76 to 1.00 carbon	6.15¢			6.15¢			(Worcester=6.35¢)								
1.01 to 1.25 carbon	8.35¢			8.35¢			(Worcester=8.55¢)								
WIRE [9]															
Bright [12]	3.05¢	3.05¢		3.05¢	3.05¢		(Worcester=3.15¢)			(Duluth=3.10¢)		3.55¢		3.44¢	3.41¢
Galvanized	Add proper size extra and galvanizing extra to Bright Wire Base														
Spring (high carbon)	4.00¢	4.00¢		4.00¢			(Worcester=4.10¢)			(Trenton=4.25¢)		4.50¢		4.39¢	4.339¢
PILING															
Steel sheet	2.65¢	2.65¢				2.65¢						3.20¢		2.99¢	3.01¢

CORROSION AND HEAT RESISTANT STEELS

In cents per pound, f.o.b. basing point

BASING POINT	Chromium Nickel		Straight Chromium			
	No. 304	No. 302	No. 410	No. 430	No. 442	No. 446
Ingot, P'gh, Chi, Canton, Balt, Reading, Ft. Wayne, Phila.	Subject to negotiation			Subject to negotiation		
Blooms, P'gh, Chi, Canton, Phila, Reading, Ft. Wayne, Balt.	22.99	24.67	17.01	17.47	20.69	25.29
Slabs, P'gh, Chi, Canton, Balt, Phila, Reading	22.99	24.67	17.01	17.47	20.69	25.29
Billets P'gh, Chi, Canton, Newark, N. J., Watervliet, Syracuse, Balt.	Subject to negotiation			Subject to negotiation		
Billets, forging, P'gh, Chi, Canton, Dunkirk, Balt, Phila, Reading, Watervliet, Syracuse, Newark, N. J., Ft. Wayne, Titusville	22.99	24.67	17.01	17.47	20.69	25.29
Bars, h-r, P'gh, Chi, Canton, Dunkirk, Watervliet, Newark, N. J., Syracuse, Balt, Phila, Reading, Ft. Wayne, Titusville	27.05	25.97	20.02	20.56	24.34	29.75
Bars, c-f, P'gh, Chi, Cleve, Canton, Dunkirk, Newark, N. J., Syracuse, Balt, Phila, Reading, Ft. Wayne, Watervliet	27.05	25.97	20.02	20.56	24.34	29.75
Plates, P'gh, Middletown, Canton	31.38	29.21	23.28	23.80	28.67	33.00
Shapes, structural, P'gh, Chi	27.05	25.97	20.02	20.56	24.34	29.75
Sheets, P'gh, Chi, Middletown, Canton, Balt.	38.95	36.79	28.67	31.38	35.16	38.49
Strip, h-r, P'gh, Chi, Reading, Canton, Youngstown	25.43	23.28	18.39	18.93	25.97	37.87
Strip, c-r, P'gh, Cleve, Newark, N. J., Reading, Canton, Youngstown	32.46	30.30	23.80	24.34	34.82	56.26
Wire, c-d, Cleve, Dunkirk, Syracuse, Balt, Reading, Canton, P'gh, Newark, N. J., Phila.	27.05	25.97	20.02	20.56	24.34	29.75
Wire, flat, c-r, Cleve, Balt, Reading, Dunkirk, Canton	32.46	30.30	23.80	24.34	34.82	56.26
Rod, h-r, Newark, N. J., Syracuse	27.05	25.97	20.02	20.56	24.34	29.75
Tubing, seamless, P'gh, Chi, Canton, (4 in. to 8 in.)	72.09	72.09	.....	68.49	.....	.....

TOOL STEEL

(F.o.b. Pittsburgh, Bethlehem, Syracuse, Dunkirk. •Also Canton, O.)

An increase of 8.2 pct applies to base price and extras

	Base per lb
High speed	67¢
Straight molybdenum	54¢
Tungsten-molybdenum	57½¢
High-carbon-chromium•	43¢
Oil hardening•	24¢
Special carbon•	22¢
Extra carbon•	18¢
Regular carbon•	14¢

Warehouse prices on and east of Mississippi are 2¢ per lb higher; west of Mississippi 3¢ higher.

ELECTRICAL SHEETS

Base, all grades f.o.b. Pittsburgh

	per lb
Field grade	3.90¢
Armature	4.25¢
Electrical	4.75¢
Motor	5.425¢
Dynamo	6.125¢
Transformer 72	6.625¢
Transformer 65	7.625¢
Transformer 58	8.125¢
Transformer 52	8.925¢

F.o.b. Chicago and Gary, field grade through motor; f.o.b. Granite City, add 10¢ per 100 lb on field grade to and including dynamo. Pacific ports add 75¢ per 100 lb on all grades.

RAILS, TRACK SUPPLIES

(F.o.b. mill)

Standard rails, heavier than 60 lb	
No. 1 O.H., net ton	$43.39
Angle splice bars, 100 lb	2.85
(F.o.b. basing points)	*per net ton*
Light rails (from billets)	$49.18
Light rails (from rail steel)	49.18
	base per lb
Cut spikes	3.65¢
Screw spikes	5.55¢
Tie plate, steel	2.55¢
Tie plates, Pacific Coast	2.70¢
Track bolts	•4.75¢
Track bolts, heat treated, to railroads	•5.00¢
Track bolts, jobbers discount	63-5

•Plus a 12-pct increase effective July 1.

Basing points, light rails, Pittsburgh, Chicago, Birmingham; cut spikes and tie plates—Pittsburgh, Chicago, Portsmouth, Ohio, Weirton, W. Va., St. Louis, Kansas City, Minnequa, Colo., Birmingham and Pacific Coast ports; tie plates alone—Steelton, Pa., Buffalo. Cut spikes alone—Youngstown, Lebanon, Pa., Richmond, Oregon and Washington ports, add 25¢.

SHELL STEEL

	per gross ton
3 in. to 12 in.	$52.00
12 in. to 18 in.	54.00
18 in. and over	56.00

Basic openhearth shell steel, f.o.b. Pittsburgh, Chicago, Buffalo, Gary, Cleveland, Youngstown and Birmingham.

Prices delivered Detroit are $2.00 higher; East Michigan, $3 higher.

Price Exceptions: Follansbee Steel Corp. permitted to sell at $13.00 per gross ton, f.o.b. Toronto, Ohio, above base price of $52.00.

Note: The above base prices apply on lots of 1000 tons of a size and section to which are to be added extras for chemical requirements, cutting, or quantity.

CLAD STEEL

Base prices, cents per pound

	Plate	Sheet
Stainless-clad		
No. 304, 20 pct, f.o.b. Pittsburgh, Washington, Pa.	21.00•	22.00
Nickel-clad		
10 pct, f.o.b. Coatesville, Pa.	18.72	....
Inconel-clad		
10 pct, f.o.b. Coatesville	26.00	....
Monel-clad		
10 pct, f.o.b. Coatesville	24.96	....
Aluminized steel		
Hot dip, 20 gage, f.o.b. Pittsburgh	....	9.00

•Includes annealing and pickling.

WIRE PRODUCTS

To the dealer, f.o.b. Pittsburgh, Chicago, Cleveland, Birmingham, Duluth

	Basing Points Named	Pacific Coast Basing Points†
	base per keg	
Standard wire nails	$3.75	$4.25
Coated nails	3.75	4.25
Cut nails, carloads	4.85	....
	base per 100 lb	
Annealed fence wire	$3.50	$4.00
Annealed galv. fence wire	3.85	4.35
	base column	
Woven wire fence•	72	90
Fence posts, carloads	74	91
Single loop bale ties††	72	97
Galvanized barbed wire••	79	89
Twisted barbless wire	79	89

•15½ gage and heavier. ••On 80-rod spools in carload quantities.

†Prices subject to switching or transportation charges.

††Add 50c a ton.

ROOFING TERNEPLATE

(F.o.b. Pittsburgh, 112 sheets)

	20x14 in.	20x28 in.
8-lb coating I.C.	$8.50	$17.00
15-lb coating I.C.	9.50	19.00
20-lb coating I.C.	10.00	20.00

ALLOY EXTRAS

Alloy Steel	Basic Openhearth		Electric Furnace	
	Bars and Bar-strip	Billets, Blooms and Slabs	Bars and Bar-strip	Billets, Blooms and Slabs
A 8600	0.676¢	$13.52	1.196¢	$23.92
A 8700	0.728	14.56	1.248	24.96
NE 9400	0.780	15.60	1.300	26.00
NE 9700	0.676	13.52	1.196	23.92
NE 9800	1.352	27.04	1.872	37.44
NE 9900	1.248	24.96	1.612	32.24

The extras shown are in addition to the base price of $2.92 per 100 lb on finished products and $58.43 per gross ton on semifinished steel, major basing points, as shown in table, opposite page, and are in cents per pound when applicable to bars and bar-strip and in dollars per gross ton when applicable to billets, blooms and slabs. When acid openhearth is specified and acceptable, add to basic openhearth alloy differential 0.27¢ per lb for bars and bar-strip and $5.14 per gross ton for billets, blooms and slabs. Alloy price increases are retroactive to Mar. 1.

WELDED PIPE AND TUBING

Base discounts, f.o.b. Pittsburgh district and Lorain, Ohio, mills

(F.o.b. Pittsburgh only on wrought pipe) base price—$200.00 per net ton

Steel (buttweld)

	Black	Galv.
½-in.	60½	48
¾-in.	63½	52
1-in. to 3-in.	65½	54½

Wrought Iron (buttweld)

½-in.	17⅞	+4⅜
¾-in.	24¼	2⅝
1-in. and 1¼-in.	28⅝	9⅛
1½-in.	33	11⅞
2-in.	32⅜	11⅜

Steel (lapweld)

2-in.	58	46½
2½-in. and 3-in.	61	49½
3½-in. to 6-in.	63	51½

Wrought Iron (lapweld)

2-in.	24⅞	4⅞
2½-in. to 3½-in.	25⅞	7½
4-in.	28⅛	11⅜
4½-in. to 8-in.	27	10¼

Steel (butt, extra strong, plain ends)

½-in.	58½	47½
¾-in.	62½	51½
1-in. to 3-in.	64	54

Wrought Iron (same as above)

½-in.	18⅞	+1⅝
¾-in.	25⅜	4¾
1-in. to 2-in.	33	13

Steel (lap, extra strong, plain ends)

2-in.	56	45½
2½-in. and 3-in.	60	49½
3½-in. to 6-in.	63½	53

Wrought Iron (same as above)

2-in.	28⅛	8⅝
2½-in. to 4-in.	34	16¼
4½-in. to 6-in.	32⅝	14⅝

On buttweld and lapweld steel pipe jobbers are granted a discount of 5 pct. On l.c.l. shipments prices are determined by adding 25 pct and 30 pct and the carload freight rate to the base card.

F.o.b. Gary prices are two points lower discount or $4 a ton higher than Pittsburgh or Lorain on lapweld and one point lower discount, or $2 a ton higher on all buttweld.

BOILER TUBES

Seamless steel and lapweld commercial boiler tubes and locomotive tubes, minimum wall. Net base prices per 100 ft f.o.b. Pittsburgh, in carload lots

	Seamless Cold-Drawn	Seamless Hot-Rolled	Lapweld, Hot-Rolled
2 in. O.D. 13 B.W.G.	16.52	13.90	13.20
2½ in. O.D. 12 B.W.G.	22.21	18.70	17.67
3 in. O.D. 12 B.W.G.	24.71	20.79	19.56
3½ in. O.D. 11 B.W.G.	31.18	26.25	24.68
4 in. O.D. 10 B.W.G.	38.68	32.56	30.55

(Extras for less carload quantities)

40,000 lb or ft and over	Base
30,000 lb or ft to 39,999 lb or ft	5 pct
20,000 lb or ft to 29,999 lb or ft	10 pct
10,000 lb or ft to 19,999 lb or ft	20 pct
5,000 lb or ft to 9,999 lb or ft	30 pct
2,000 lb or ft to 4,999 lb or ft	45 pct
Under 2,000 lb or ft	65 pct

CAST IRON WATER PIPE

Subject to retroactive adjustment for pig iron.

	Per net ton
6-in. to 24-in., del'd Chicago	$66.33
6-in. to 24-in., del'd New York	65.60
6-in. to 24-in., Birmingham	57.00
6-in. and larger, f.o.b. cars, San Francisco, Los Angeles or Seattle for all rail shipment; rail and water shipment less	80.40

Class "A" and gas pipe, $5 extra; 4-in. pipe is $5 a ton above 6-in.

BOLTS, NUTS, RIVETS, SET SCREWS

An increase of 12 pct applies to all listings
(Effective July 1, 1946)

Bolts and Nuts
(F.o.b. Pittsburgh, Cleveland, Birmingham or Chicago)

Machine and Carriage Bolts
Base discount less case lots

	Percent Off List
½ in. & smaller x 6 in. & shorter	65½
9/16 & ⅝ in. x 6 in. & shorter	63½
¾ to 1 in. x 6 in. & shorter	61
1⅛ in. and larger, all lengths	59
All diameters over 6 in. long	59
Lag, all sizes	62
Plow bolts	65

Nuts, Cold Punched or Hot Pressed
(Hexagon or Square)

½ in. and smaller	62
9/16 to 1 in. inclusive	59
1⅛ to 1½ in. inclusive	57
1⅝ in. and larger	56

On above bolts and nuts, excepting plow bolts, additional allowance of 10 pct for full container quantities. There is an additional 5 pct allowance for carload shipments.

Semifin. Hexagon Nuts	U.S.S.	S.A.E.
Base discount less keg lots		
7/16 in. and smaller	..	64
½ in. and smaller	62	..
½ in. through 1 in.	..	60
9/16 in. through 1 in.	59	..
1⅛ in. through 1½ in.	57	58
1⅝ in. and larger	56	..

In full keg lots, 10 pct additional discount.

Stove Bolts

	Consumer
Packages, nuts loose	71 and 10
In packages	71
In bulk	80

On stove bolts freight allowed up to 65¢ per 100 lb based on Cleveland, Chicago, New York on lots of 200 lb or over.

Large Rivets
(½ in. and larger)

	Base per 100 Lb
F.o.b. Pittsburgh, Cleveland, Chicago, Birmingham	$3.75

Small Rivets
(7/16 in. and smaller)

	Percent Off List
F.o.b. Pittsburgh, Cleveland, Chicago, Birmingham	65 and 5

Cap and Set Screws

	Percent Off List Consumer
Upset full fin, hexagon head cap screws, coarse or fine thread, up to and incl. 1 in. x 6 in.	64
Upset set screws, cup and oval points	71
Milled studs	46
Flat head cap screws, listed sizes	36
Fillister head cap, listed sizes	51

Freight allowed up to 65¢ per 100 lb based on Cleveland, Chicago or New York on lots of 200 lb or over.

FLUORSPAR

Maximum price f.o.b. consumer's plant, $30 per short ton plus either (1) rail freight from producer to consumer, or (2) rail freight from Rosiclare, Ill., to consumer, whichever is lower.

Effective CaF_2 Content:	Base price per short ton
70% or more	$33.00
65% but less than 70%	32.00
60% but less than 65%	31.00
Less than 60%	30.00

LAKE SUPERIOR ORES

(51.50% Fe, Natural Content, Delivered Lower Lake Ports)

	Per Gross Ton
Old range, bessemer	$5.45
Old range, non-bessemer	5.30
Mesaba, bessemer	5.20
Mesaba, non-bessemer	5.05
High phosphorus	5.05

Prices are for ore shipped on and after June 24, 1946, and for ore covered by adjustable pricing agreements authorized by Order No. 8, RMPR 113.

These prices do not reflect the recent ICC increase in freight rates.

METAL POWDERS

Prices are based on current market prices of ingots plus a fixed figure. F.o.b. shipping point, cents per lb, ton lots.

Brass, minus 100 mesh	18.5¢ to 20.25¢
Copper, electrolytic, 150 and 200 mesh	21½¢ to 23½¢
Copper, reduced, 150 and 200 mesh	20½¢ to 25½¢
Iron, commercial, 100, 200, 325, mesh 96 + % Fe	11¢ to 16¢
Iron, crushed, 200 mesh and finer, 90 + % Fe carload lots	4¢
Iron, hydrogen reduced, 300 mesh and finer, 98½ + % Fe, drum lots	63¢
Iron, electrolytic, unannealed, 325 mesh and coarser, 99 + % Fe	27¢ to 42¢
Iron, electrolytic, annealed minus 100 mesh, 99 + % Fe	31¢
Iron carbonyl, 300 mesh and finer, 98-99.8 + % Fe	90¢
Aluminum, 100 and 200 mesh	*25¢
Antimony, 100 mesh	30¢
Cadmium, 100 mesh	$1.40
Chromium, 100 mesh and finer	$1.25
Lead, 100, 200 & 300 mesh	11½ to 15¢
Manganese, minus 325 mesh and coarser	44¢ to 61¢
Nickel, 150 mesh	51½¢
Silicon, minus 325 mesh and coarser	26¢ to 55¢
Solder powder, 100 mesh	8½¢ plus metal
Tin, 100 mesh	58¾¢
Tungsten metal powder, 98%-99%, any quantity, per lb	$2.60
Molybdenum powder, 99%, in 200-lb kegs, f.o.b. York, Pa., per lb	$2.60
Under 100 lb	$3.00

*Freight allowed east of Mississippi.

COKE

	Net Ton
Furnace, beehive (f.o.b. oven)	
Connellsville, Pa.	$8.75
Connellsville, Pa., hand drawn	9.35
Foundry, beehive (f.o.b. oven)	
Fayette Co., W. Va.	8.95
Connellsville, Pa.	9.85
Foundry, Byproduct	
Chicago, del'd	15.10
Chicago, f.o.b.	14.35
New England, del'd	16.00
Kearny, N. J., f.o.b.	14.40
Philadelphia, del'd	14.63
Buffalo, del'd	14.75
Portsmouth, Ohio, f.o.b.	12.85
Painesville, Ohio, f.o.b.	13.50
Erie, del'd	14.50
Cleveland, del'd	14.55
Cincinnati, del'd	14.60
St. Louis, del'd	15.10†
Birmingham, del'd	12.25

†Except producers situated in states other than Missouri, Alabama or Tennessee, sellers may charge a maximum delivered price of $15.60 in the St. Louis Mo., and East St. Louis, Ill., switching districts.

REFRACTORIES

(F.o.b. Works)

Fire Clay Brick

	Per 1000
Super-duty brick, St. Louis	$76.05
First quality, Pa., Md., Ky., Mo., Ill., Ohio	60.40
First quality, New Jersey	65.90
Sec. quality, Pa., Md., Ky., Mo., Ill.	54.80
Sec. quality, New Jersey	57.70
Sec. quality, Ohio	52.95
Ground fire clay, net ton, bulk	8.95

Silica Brick

Pennsylvania and Birmingham	$60.40
Chicago District	69.30
Silica cement, net ton (Eastern)	10.60

Chrome Brick — *Per Net Ton*

Standard chemically bonded, Balt., Plymouth Meeting, Chester	$54.00

Magnesite Brick

Standard, Balt. and Chester	$76.00
Chemically bonded, Baltimore	65.00

Grain Magnesite

Domestic, f.o.b. Balt. and Chester in sacks (carloads)	$43.48
Domestic, f.o.b. Chewelah, Wash. in bulk	22.00
in sacks	26.00
Clinker (dead burned) dolomite, per ton	

East, $9.30; Midwest, add 10¢; Mo. Valley, add 20¢.

WAREHOUSE PRICES

Delivered metropolitan areas per 100 lb.

Cities	SHEETS			STRIP			Plates ¼ in. and heavier	Structural Shapes	BARS		ALLOY BARS			
				Hot-Rolled										
	Hot-Rolled (10 gage)	Cold-Rolled	Galvanized (24 gage)	6 in. and Under	Over 6 in.	Cold-Rolled			Hot-Rolled	Cold-Finished	Hot-Rolled, A-8617-20	Hot-Rolled, A-8742-50 Ann.	Cold-Drawn, A-8617-20	Cold-Drawn, A-8742-50 Ann.
**Philadelphia	$3.743	$5.097	$5.218a	$4.272	$4.172	$5.022	$3.855	$3.916	$4.072	$4.522	$6.016	$7.116	$7.372	$8.422
New York	3.815	4.838[1]	5.46	4.324	4.224	5.024	4.018	4.008	4.103	4.553	6.058	7.158	7.403	8.453
Boston	3.999	4.969[3]	5.674	4.456	4.356	4.965	4.162	4.162	4.294	4.594	6.212	7.312	7.444	8.494
Baltimore	3.619	5.077	5.344	4.252	4.152	....	3.844	4.009	4.052	4.502	6.109	7.209	7.352	8.402
Norfolk	3.996	....	5.821	4.515	4.415	....	4.221	4.252	4.315	4.615	....	....	....	....
Chicago	3.475	4.425	5.581	3.95	3.85	4.96[6]	3.80	3.80	3.75	4.20	5.80	6.90	....	8.00
Milwaukee	3.612	4.562[1]	5.537	4.087	4.077	5.037[6]	3.937	3.937	3.887	4.337	6.037	7.037	7.187	8.237
Cleveland	3.575	4.625	5.327	3.95	3.85	4.70[6]	3.65	3.838	3.60	4.20	6.006	7.106	6.95	8.00
Buffalo	3.575	4.625	5.20	4.169	4.069	4.919[6]	3.88	3.65	3.60	4.20	5.80	6.90	6.95	8.00
Detroit	3.675	4.725	5.45	4.05	3.95	....	3.859	3.911	3.70	4.25	6.13	7.23	7.259	8.309
Cincinnati	3.65	4.70[1]	5.275	4.025	3.925	4.961	3.911	3.941	3.861	4.461	6.15	7.25	7.311	8.361
St. Louis	3.622	4.572[1]	5.581	4.097	3.997	5.181[6]	3.947	3.947	3.897	4.481	6.181	....	7.331	....
Pittsburgh	3.575	4.625	5.20	3.95	3.85	4.70	3.65	3.65	3.60	4.20	5.80	6.90	6.95	7.95
St. Paul	3.797	4.747	5.635	4.272	4.172	5.352	4.122	4.122	4.072	4.811	6.202	6.302	7.352	7.402
Omaha	4.018	5.668	5.965	4.493	4.393	....	4.343	4.343	4.293	4.893	....	....	....	....
Indianapolis	3 745	4.795	5.37	4.12	4.02	4.99	3.88	3.83	3.83	4.43	6.13	....	7.28	....
Birmingham	3.675	....	5.20	4.05	3.95	....	3.80	3.80	3.75	4.903	....	....	....	....
Memphis	4.19	4.885	5.715	4.565	4.465	....	4.315	4.315	4.265	4.78	....	....	....	....
New Orleans	4.283*	5.304	5.808	4.658	4.558	....	4.408	4.408*	4.358*	5.079	....	....	....	....
Houston	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Los Angeles	4.85	6.60[1]	6.55	5.30	5.20	....	4.80	4.70	4.65	6.03	....	....	....	....
San Francisco	4.12	6.87	6.35	4.60	4.50	4.15	4.15	4.15	4.30	5.78	....	....	....	....
Seattle	4.87[5]	7.27[2]	6.40	4.60	4.50	....	5.00[5]	4.70[5]	4.60[5]	6.23	....	....	....	....
Portland	4.87[4]	6.82[2]	6.20	5.10	5.00	....	5.00[4]	4.70[4]	4.70[4]	5.98	8.15	....	9.20	....
Salt Lake City	4.75	....	6.62[7]	5.88	5.78	....	5.23[7]	5.23[7]	5.13	6.35	....	....	....	....

BASE QUANTITIES

Standard unless otherwise keyed on prices.

HOT-ROLLED: Sheets, strip, plates, shapes and bars, 400 to 1999 lb.

COLD-ROLLED: Sheets, 400 to 1999 lb; strip, extras on all quantities; bars, 1500 lb base.

NE ALLOY BARS: 1000 to 39,999 lb.

GALVANIZED SHEETS: 450 to 1499 lb.

EXCEPTIONS: (1) 400 to 1499 lb; (2) 450 to 1499 lb; (3) 450 to 3749 lb; (4) 300 to 4999 lb; (5) 300 to 10,000 lb; (6) 2000 lb and over; (7) 3500 lb and over.

(a) Philadelphia: Galvanized sheet, 25 or more bundles.

Extra for size, quality, etc., apply on above quotations.

* Add 0.271¢ for sizes not rolled in Birmingham.

** City of Philadelphia only. Applicable freight rates must be added to basing point prices to obtain delivered price to other localities in metropolitan area.

PIG IRON PRICES

Per gross ton, subject to retroactive adjustment.

These prices do not reflect the recent ICC increase in freight rates. New prices will be published as soon as various state commissions approve the increases.

BASING POINT PRICES

Basing Point	Basic	No. 2 Foundry	Malleable	Bessemer	Low Phos.
Bethlehem	27.00	27.50	28.00	28.50	....
Birdsboro	27.00	27.50	28.00	28.50	32.00
Birmingham	25.50	26.88*	....	27.50	....
Buffalo	25.50	26.50	27.00	27.50	32.00
Chicago	26.00	26.50	26.50	27.00	....
Cleveland	26.00	26.50	26.50	27.00	....
Detroit	26.00	26.50	26.50	27.00	....
Duluth	26.50	27.00	27.00	27.50	....
Erie	26.00	26.50	27.00	27.50	....
Everett	27.00	27.50	28.00	28.50	....
Granite City	26.00	26.50	26.50	27.00	....
Hamilton	26.00	26.50	26.50	....	....
Neville Island	26.00	26.50	26.50	27.00	....
Provo	24.00	24.50	....	....	....
Sharpsville	26.00	26.50	26.50	27.00	....
Sparrows Point	27.00	27.50	....	....	....
Steelton	27.00	....	....	....	32.00
Swedeland	27.00	27.50	28.00	28.50	....
Toledo	26.00	26.50	26.50	27.00	....
Youngstown[1]	26.00	26.50	26.50	27.00	....

DELIVERED PRICES (BASE GRADES)

Consuming Point	Basing Point	Freight Rate	Basic	No. 2 Foundry	Malleable	Bessemer	Low Phos.
Boston	Everett	0.50	27.50	28.00	28.50	29.00	....
Boston	Birdsboro-Steelton	4.02	....	....	....	....	38.02
Brooklyn	Bethlehem	2.50	29.50	30.00	30.50	31.00	....
Brooklyn	Birdsboro	2.92	....	....	....	....	34.92
Canton	Clev, Ygstn, Sharpsvil.	1.39	27.39	27.89	27.89	28.39	....
Canton	Buffalo	3.19	....	....	....	....	35.10
Cincinnati	Birmingham	4.06	29.56	30.94†	....	....	....
Cincinnati	Hamilton	1.11	....	....	27.61	....	....
Cincinnati	Buffalo	4.40	....	....	....	....	36.40
Jersey City	Bethlehem	1.53	28.53	29.03	29.53	30.03	....
Jersey City	Birdsboro	1.94	....	....	....	....	33.94
Los Angeles	Provo	4.95	28.95	29.45	....	....	....
Los Angeles	Buffalo	15.41	....	....	....	....	47.41
Mansfield	Cleveland-Toledo	1.94	27.94	28.44	28.44	28.94	....
Mansfield	Buffalo	3.36	....	....	....	....	35.38
Philadelphia	Swedeland	0.84	27.84	28.34	28.84	29.34	....
Philadelphia	Birdsboro	1.24	....	....	....	....	33.24
San Francisco	Provo	4.95	28.95	29.45	....	....	....
San Francisco	Buffalo	15.41	....	....	....	....	47.41
Seattle	Provo	4.95	28.95	29.45	....	....	....
Seattle	Buffalo	15.41	....	....	....	....	47.41
St. Louis	Granite City	0.50	26.50	27.00	27.00	27.50	....
St. Louis	Buffalo	7.07	....	....	....	....	39.0

* $22.88 to $26.88.
† $26.94 to $30.94.

(1) Struthers Iron & Steel Co., Struthers, Ohio, may charge 50¢ per ton in excess of basing point prices for No. 2 foundry, basic, bessemer and malleable.

Charcoal pig iron base prices for Lyles, Tenn., and Lake Superior furnaces, $33.00 and $34.00, respectively. Newberry Brand of Lake Superior charcoal iron $39.00 per g.t., f.o.b. furnace. Delivered to Chicago, $42.34.

High phosphorus iron sells at Lyles, Tenn., at $28.50.

Basing point prices are subject to switching charges; silicon differentials (not to exceed 50¢ per ton for each 0.25 pct silicon content in excess of base grade which is 1.75 to 2.25 pct); phosphorus differentials, a reduction of 38¢ per ton for phosphorous content of 0.70 pct and over; manganese differentials, a charge not to exceed 50¢ per ton for each 0.50 pct manganese content in excess of 1.00 pct. $2 per ton extra may be charged for 0.5 to 0.75 pct nickel content and $1 per ton extra for each additional 0.25 pct nickel.

Silvery iron, silicon 6.00 to 6.50 pct, C/L per g.t., f.o.b. Jackson, Ohio—$32.00; f.o.b. Buffalo—$33.25. Add $1.00 per ton for each additional 0.50 pct Si. Add 50¢ per ton for each 0.50 pct Mn over 1.00 pct. Add $1.00 per ton for prices of comparable analysis.

Ferromanganese

78-82% Mn, maximum contract base price, gross ton, lump size, f.o.b. Baltimore, Philadelphia, New York, Birmingham, Rockdale, Rockwood, Tenn.

Carload lots (bulk)	$135.00
Less ton lots (packed)	148.50
F.o.b. Pittsburgh	139.50

$1.70 for each 1% above 82% Mn; penalty, $1.70 for each 1% below 78%.

Briquets—cents per pound of briquet, freight allowed, 66% contained Mn.

	Eastern	Central	Western
Carload, bulk	6.05	6.30	6.60
Ton lots	6.65	7.55	8.55
Less ton lots	6.80	7.80	8.80

Spiegeleisen

Contract prices, gross ton, lump, f.o.b. Palmerton, Pa.

	16-19% Mn 3% max. Si	19-21% Mn 3% max. Si
Carloads	$35.00	$36.00
Less ton	47.50	48.50
F.o.b. Pittsburgh, Chicago	40.00	

Manganese Metal

Contract basis, lump size, cents per pound of metal, f.o.b. shipping point, freight allowed.

96-98% Mn, 0.2% max. C, 1% max. Si, 2% max. Fe.

Carload, bulk	30
L.c.l. lots	32

Electrolytic Manganese

F.o.b. Knoxville, Tenn., freight allowed east of Mississippi, cents per pound.

Carloads	32
Ton lots	34
Less ton lots	36

Low-Carbon Ferromanganese

Contract price, cents per pound Mn contained, lump size, f.o.b. shipping point, freight allowed, eastern zone.

	Carloads	Ton	Less
0.10% max. C, 0.06% P, 90% Mn	21.00	21.40	21.65
0.10% max. C	20.50	20.90	21.15
0.15% max. C	20.00	20.40	20.65
0.30% max. C	19.50	19.90	20.15
0.50% max. C	19.00	19.40	19.65
0.75% max. C, 7.00% max. Si	16.00	16.40	16.65

Silicomanganese

Contract basis, lump size, cents per pound of metal, f.o.b. shipping point, freight allowed. 65-70% Mn, 17-20% Si, 1.5% max. C.

Carload, bulk	6.05
Ton lots	6.70
Briquet, contract basis, carlots, bulk freight allowed, per lb of briquet	5.80
Ton lots	6.30
Less ton lots	6.55

Silvery Iron (electric furnace)

Si 14.01 to 14.50%, $51.25 f.o.b. Keokuk, Iowa; $48.00 f.o.b. Jackson, Ohio; $49.25 f.o.b. Niagara Falls. Add $1.00 per ton for each additional 0.50% Si up to and including 18%. Add $1.00 per ton for low impurities, not to exceed: P—0.05%, S—0.04%, C—1.00%.

Silicon Metal

Contract price, cents per pound contained Si, lump size, f.o.b. shipping point, freight allowed, for ton lots, packed.

	Eastern	Central	Western
96% Si, 2% Fe	13.10	13.55	16.50
97% Si, 1% Fe	13.45	13.90	16.80

Ferrosilicon Briquets

Contract price, cents per pound of briquet, bulk, f.o.b. shipping point, freight allowed to destination, 40% Si.

	Eastern	Central	Western
Carload, bulk	3.60	3.75	3.90
Ton lots	4.05	4.55	4.60
Less ton lots	4.45	4.80	4.85

Electric Ferrosilicon

Contract price, cents per pound contained Si, lump size in carloads, f.o.b. shipping point, freight allowed.

	Eastern	Central	Western
50% Si	7.05	7.50	7.65
75% Si	8.55	8.70	9.25
80-90% Si	9.50	9.65	10.15
90-95% Si	11.80	11.95	12.40

Ferrochrome

(65-72% Cr, 2% max. Si)

Contract prices, cents per pound, contained Cr, lump size in carloads, f.o.b. shipping point, freight allowed.

	Eastern	Central	Western
0.06% C	23.00	23.40	24.00
0.10% C	22.50	22.90	23.50
0.15% C	22.00	22.40	23.00
0.20% C	21.50	21.90	22.50
0.50% C	21.00	21.40	22.00
1.00% C	20.50	20.90	21.50
2.00% C	19.50	19.90	20.50
66-71% Cr, 4-10% C	14.50	14.90	15.00
62-66% Cr, 5-7% C	15.05	15.45	15.55

Briquets—contract price, cents per pound of briquet, f.o.b. shipping point, freight allowed, 60% chromium.

	Eastern	Central	Western
Carload, bulk	9.20	9.50	9.90
Ton lots	9.80	10.30	11.80
Less ton lots	10.10	10.60	12.10

High-Nitrogen Ferrochrome

Low-carbon type: 67-72% Cr, 0.75% N. Add 2¢ per lb to regular low-carbon ferrochrome price schedule. Add 2¢ for each additional 0.25% N. High-carbon type: 66.71% Cr, 4-5% C, 0.75% N. Add 5¢ per lb to regular high-carbon ferrochrome price schedule.

S. M. Ferrochrome

Contract price, cents per pound chromium contained, lump size, f.o.b. shipping point, freight allowed.

High carbon type: 60-65% Cr, 4-6% Si, 4-6% Mn, 4-6% C.

	Eastern	Central	Western
Carload	15.60	16.00	16.10
Ton lots	16.65	17.30	18.50
Less ton lots	17.30	17.95	19.15

Low carbon type: 62-66% Cr, 4-6% Si, 4-6% Mn, 1.25% max. C.

	Eastern	Central	Western
Carload	20.00	20.40	21.00
Ton lots	21.00	21.65	22.85
Less ton lots	22.00	22.65	23.85

Chromium Metal

Contract prices, cents per lb, chromium contained, carload, f.o.b. shipping point, freight allowed. 97% min. Cr, 1% max. Fe.

	Eastern	Central	Western
0.20% max. C	83.50	85.00	86.25
0.50% max. C	79.50	81.00	82.25
9.00% min. C	79.50	81.00	82.25

Chromium—Copper

Contract price, cents per pound of alloy, f.o.b. Niagara Falls, freight allowed east of the Mississippi. 8-11% Cr, 88-90% Cu, 1.00% max. Fe, 0.50% max. Si.

Shot or ingot	45¢

Calcium—Silicon

Contract price per lb of alloy, lump, f.o.b. shipping point, freight allowed.

30-35% Ca, 60-65% Si, 3.00% max. Fe or 28-32% Ca, 60-65% Si, 6.00% max. Fe.

	Eastern	Central	Western
Carloads	13.00	13.50	15.55
Ton lots	14.50	15.25	17.40
Less ton lots	15.50	16.25	18.40

Calcium—Manganese—Silicon

Contract prices, cents per lb of alloy, lump, f.o.b. shipping point, freight allowed.

16-20% Ca, 14-18% Mn, 53-59% Si.

	Eastern	Central	Western
Carloads	15.50	16.00	18.05
Ton lots	16.50	17.35	19.10
Less ton lots	17.00	17.85	19.60

Calcium Metal

Eastern zone contract prices, cents per pound of metal, f.o.b. shipping point, freight allowed. Add 1¢ for central zone; 5¢ for western zone.

	Cast	Turnings	Distilled
Ton lots	$1.35	$1.75	$4.25
Less ton lots	1.60	2.00	5.00

CMSZ

Contract price, cents per pound of alloy, f.o.b. shipping point, freight allowed.

Alloy 4: 45-49% Cr, 4-6% Mn, 18-21% Si, 1.25-1.75% Zr, 3.00-4.5% C.

	Eastern	Central	Western
Ton lots	12.00	12.75	14.75
Less ton lots	12.50	13.25	15.25

Alloy 5: 50-56% Cr, 4-6% Mn, 13.50-16.00% Si, 0.75 to 1.25% Zr, 3.50-5.00% C.

Ton lots	11.75	12.50	14.50
Less ton lots	12.25	13.00	15.00

SMZ

Contract price, cents per pound of alloy, f.o.b. shipping point, freight allowed. 60-65% Si, 5-7% Mn, 5-7% Zr, 20% Fe.

	Eastern	Central	Western
Ton lots	12.00	12.85	14.60
Less ton lots	12.50	13.35	15.10

Other Ferroalloys

Ferrotungsten, standard, lump or ¼X down, packed, f.o.b. plant Niagara Falls, Washington, Pa., York, Pa., per pound contained T, 5 ton lots, freight allowed	$1.88
Ferrovanadium, 35-55%, contract basis, f.o.b. plant, freight allowances, per pound contained V.	
Openhearth	$2.70
Crucible	$2.80
High speed steel (Primos)	$2.90
Vanadium pentoxide, 88-92% V_2O_5 technical grade, contract basis, per pound contained V_2O_5	$1.10
Ferrocolumbium, 50-60%, contract basis, f.o.b. plant, freight allowed, per pound contained Cb.	
Ton lots	$2.25
Less ton lots	$2.30
Ferromolybdenum, 55-75%, f.o.b. Langeloth, Washington, Pa., per pound contained Mo	95¢
Calcium molybdate, 40-45%, f.o.b. Langeloth, Washington, Pa., per pound contained Mo	80¢
Molybdenum oxide briquets, 48-52% Mo, f.o.b. Langeloth, Pa., per pound contained Mo	80¢
Molybdenum oxide, in cans, f.o.b. Langeloth and Washington, Pa., per pound contained Mo	80¢
Ferrotitanium, 40-45%, 0.10%C max., f.o.b. Niagara Falls, N. Y., ton lots, per pound contained Ti	$1.23
Less ton lots	$1.25
Ferrotitanium, 20-25%, 0.10%C max., ton lots, per pound contained Ti	$1.35
Less ton lots	$1.40
High-carbon ferrotitanium, 15-20%, 6-8% C, contract basis, f.o.b. Niagara Falls, freight allowed, carloads	$142.50
Ferrophosphorus, 18%, electric or blast furnaces, f.o.b. Anniston, Ala., carlots, with $3 unitage freight equalled with Rockdale, Tenn., per gross ton	$58.50
Ferrophosphorus, Electrolytic, 23-26%, carlots, f.o.b. Monsanto (Siglo), Tenn., $3 unitage freight equalized with Nashville, per gross ton	$75.00
Zirconium, 35-40%, contract basis, f.o.b. plant, freight allowed, per pound of alloy.	
Carload lots	14¢
Zirconium, 12-15%, contract basis, lump, f.o.b. plant, freight allowed, per pound of alloy	
Carload, bulk	4.60¢
Alsifer, 20% Al, 40% Si, 40% Fe, contract basis, f.o.b. Niagara Falls, carload	5.75¢
Ton lots	7.25¢
Simanal, 20% Si, 20% Mn, 20% Al, contract basis, f.o.b. Philo, Ohio, freight allowed, per pound	
Car lots	8.00¢
Ton lots	8.75¢
Less ton lots	9.25¢

Boron Agents

Contract prices per pound of alloy, f.o.b. shipping point, freight allowed.

Ferroboron, 17.50% min. B, 1.50% max. Si, 0.50% max. Al, 0.50% max. C.

	Eastern	Central	Western
Less ton lots	$1.30	$1.3075	$1.329

Manganese—Boron 75.00% Mn, 15-20% B, 5% max. Fe, 1.50% max. Si, 3.00% max. C.

Ton lots	$1.89	$1.903	$1.935
Less ton lots	2.01	2.023	2.055

Nickel—Boron 15-18% B, 1.00% max. Al, 1.50% max. Si, 0.50% max. C, 3.00% max. Fe, balance Ni.

Less ton lots	$2.10	$2.1125	$2.1445

Silcaz No. 3, contract basis, f.o.b. plant, freight allowed, per pound of alloy.	
carload lots	25¢
Ton lots	26¢
Silvaz No. 3, contract basis, f.o.b. plant, freight allowed, per pound of alloy.	
Carload lots	58¢
Ton lots	59¢
Grainal, f.o.b. Bridgeville, Pa., freight allowed, 50 lb and over.	
No. 1	87.5¢
No. 6	60¢
No. 79	45¢
Bortram, f.o.b. Niagara Falls	
Ton lots, per pound	45¢
Less ton lots, per pound	50¢

Federal Reserve Board Executive Finds Price Curbs No Recovery Aid

Washington

• • • In an analysis of the inflationary forces in the United States, Charles O. Hardy, vice-president of the Federal Reserve Bank of Kansas City and formerly an economist with the Brookings Institution, foresaw no possibility of serious consequences from the absence of "both price restraints and price supports."

This article, fourth in a series on postwar economic conditions, was published by the Federal Reserve Board here. The board, however, assumed no responsibility for the opinions expressed therein.

Although he thought "selective" price controls might be continued until supply and demand are in balance, Mr. Hardy could find little of merit in price controls as such.

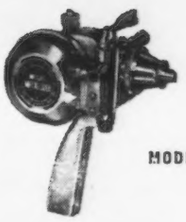
"Accidents of price control administration distort the relative profitability of different lines of production, and management tends to allocate resources to the lines where ceilings are most favorable rather than those where unsatisfied demands are greatest," he declared.

Although he held that price controls were most useful when employed on a selective basis to help retard the "sporadic" type of inflation we now have in this country, he emphasized that "in cases of physical shortage, price control is at best a palliative."

"It does nothing to hasten, and may delay, the restoration of normal supply conditions," he asserted. "Nor does it help in determining who shall get the short supply and who shall go without. Unless coupled with a plan of rationing, it leaves the allocation to be effected by dealer favoritism or the formation of queues or the tossing of coins."

While he did not dismiss as a possibility that we may have some of what he called "monetary inflation' or "fiscal monetary inflation," Mr. Hardy dismissed as not immediately probable a "speculative" type of inflation and listed as out of the question what he

(CONTINUED ON PAGE 130)



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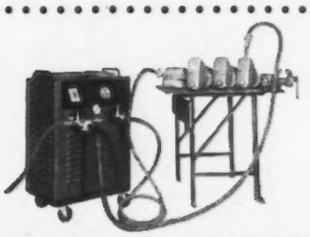
The new, Mogul Model F advanced design all-purpose metallizing gun offers you now the maximum in high speed metal spraying for greater-than-ever savings in rebuilding worn shafts, corrosion protection and production applications. Sprays all types of metals from the hardest to the softest with the finest possible atomization and deposit efficiency.

DOT WELDING

Eliminates heat distortion and makes possible the repair of defective castings, both ferrous and non-ferrous, with a fast, readily machineable, fill-in deposit of aluminum, nickel, copper, bronze or zinc. Ideal for press fit work, parts repair etc. No foundry, machine, or pattern shop can afford to be without a Mogul Dot Welder.



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Eliminates problem of porous castings forever. Circulates Mogul Cast-Seal—an absolutely pure chrome and copper flour colloidal—under pressure through the casting, sealing all fissures, porous areas and pinhole cracks with a permanent metallic bond to the thickness of the casting itself. Repairs withstand tremendous heat, and pressures up to 2100 pounds.

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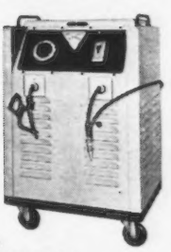
New type tinning flux that speeds your production and requires no preliminary surface preparation. Compounded of finely ground pure metals, balanced to attain high tensile strength and amazing surface adherence. Tins cast iron, steel, aluminum, copper and brass. Sold on a money back guarantee.



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Bulletins on the above Mogul units containing full information are available. Each bulletin gives complete information on how these amazing Mogul Products can be utilized to do better jobs faster, at lower cost right in your own plant or shop. Request one or all bulletins by product name. Write to Dept. M. today.

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Kearney & Trecker CSM's are expressly designed for the the most efficient use of Carbide Cutters on ferrous and non-ferrous metals.

On this job, because of the size of the workpiece and fixture — we selected a 50 h.p. CSM plain model — and equipped with the proper cutter, it zipped through the cast iron workpiece easily and speedily. The details of the operation are given below:

OPERATION: Mill coolant trough
WORK PIECE: Milling machine table
MATERIAL: Close-grain, high-tensile cast iron
CUTTER: 6" dia., 10 tooth, carbide tipped slotting
CUTTER SPEED: 180 RPM
TABLE FEED: 21 IPM
DEPTH OF CUT: ¾" to 1¾" (3/32" — ¼" each side)
METAL REMOVAL RATE: 15 cu. in. per minute at maximum depth of cut.

NOTE the special fixture which provides maximum rigidity coupled with quick change set-ups on the workpiece and especially facilitates the loading and unloading of the workpiece on the machine.

• • •

CSM Milling Machines were designed to obtain the greatest benefits from modern cutting tools, and are now part of our line of standard models. The design has been developed after complete analyses of industry's problems of milling with carbide cutters.

Because they are knee type machines, they are readily adaptable to a great variety of work. They are precision built in accordance with long established Kearney & Trecker standards, and will cut metals faster and to finer tolerances and superior finishes than ever before, with high speed steel cutters as well as carbide cutters.

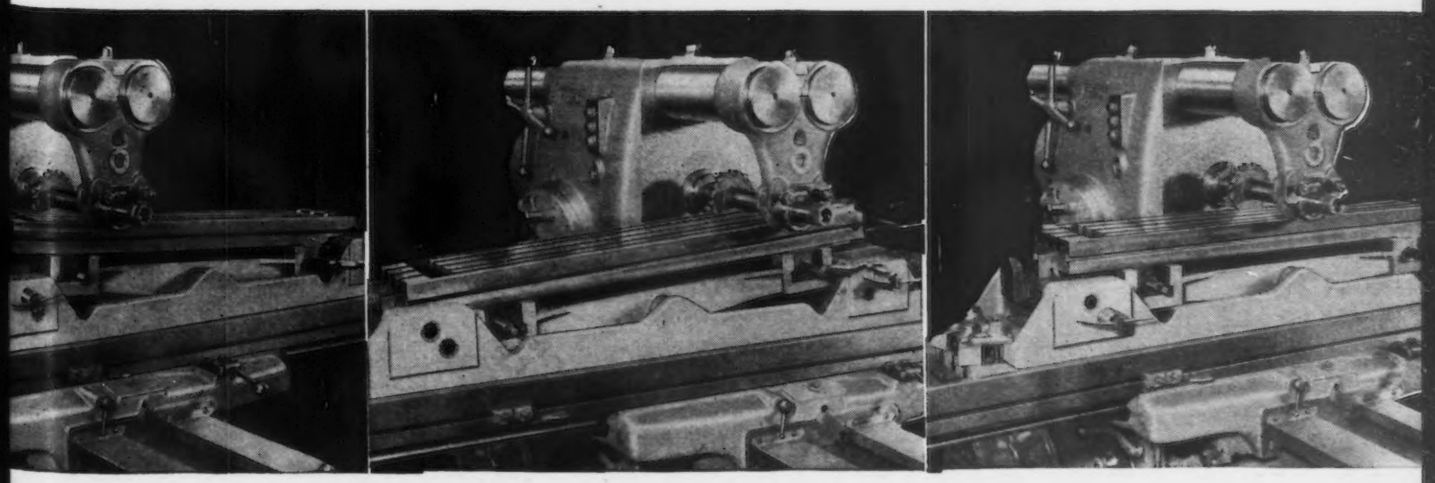
CSM machines are available in 20, 30 or 50 H.P. models in both plain and vertical knee types.

Write for complete data on CSM machines — CATALOG CSM-20. Please indicate your business connection.

Operation 1 . . .
Workpiece tilted to right in fixture. Angular coolant channel is climb milled. Maximum depth of cut: 1¾".

Operation 2 . . .
Workpiece tilted to left in fixture. Angular coolant channel conventional milled. Maximum depth of cut: 1¾".

Operation 3 . . .
Workpiece held in horizontal position in fixture. The two angular channels now blended by climb milling.



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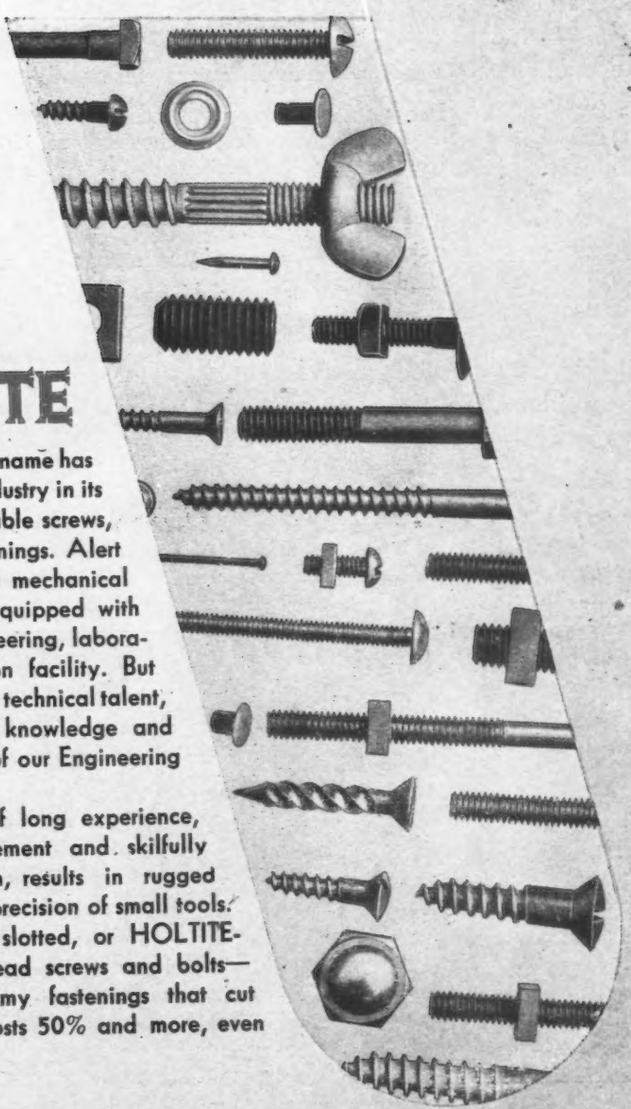

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For over 42 years this name has guided American industry in its selection of dependable screws, bolts and allied fastenings. Alert to all technical and mechanical advances, we are equipped with every modern engineering, laboratory, and production facility. But most important, is the technical talent, combined scientific knowledge and special experience of our Engineering and Research Staffs.

This combination of long experience, progressive management and skilfully directed production, results in rugged fastenings with the precision of small tools. Specify HOLTITE slotted, or HOLTITE-Phillips recessed head screws and bolts—the modern economy fastenings that cut driving time and costs 50% and more, even on finished parts.

CONTINENTAL SCREW CO. New Bedford

NEWS OF INDUSTRY

(CONTINUED FROM PAGE 127)

called "public bankruptcy inflation."

He described "fiscal monetary inflation" as a situation resulting from an over-all adjustment of prices to an increased money supply not accompanied by a corresponding increase in the supply of goods.

In the absence of control, under this situation, spending is accelerated, with the result that production rises and also, likely as not, prices.

"The expansion continues until prices and the volume of trade reach a level where the money supply is no longer excessive," he declared. "Unless by this time a speculative boom has been generated, the price trend will level off."

He called this "the most frequent type of inflation" and said it had occurred in 1915-16, again in the recovery from the price collapse of 1921, and in the upturn of 1933-35.

The writer termed farm price parity and wage parity possible causes of "an endless spiral of any initial upward movement in the level of prices."

Mr. Hardy said that "rent control will reduce residential building unless its effects are offset by subsidies, or new construction is exempted from control."

He called the wage situation "the primary source of inflationary pressure" and added that continuance of the national policy of constantly supporting demands for higher wages "would step up the prospective rate of inflation to an extent that cannot be predicted."

"The difficulty," he said, "arises more from full employment than it does from an excessive supply of money and a deficiency of goods, though, of course, these factors underlie the full employment situation. The fact is that collective bargaining with strong unions, price stability and full employment are incompatible.

"We can have any two of these, but not all three. So long as union power is not dampened down by unemployment there is no apparent power in the State strong enough to check a parallel upward sweep of wages and prices."

S — T — R — E — T — C — H — E — D to the limit!

The adverse conditions which virtually every business is experiencing have likewise prevented the supplying of Follansbee products in sufficient volume to meet demands. ☆ ☆ ☆ In view of the urgency of their needs, our customers have displayed an understanding tolerance of the situation which is gratefully appreciated. ☆ ☆ ☆ In spite of all possible efforts, present conditions indicate that appreciable relief cannot be expected in the immediate future. *A highly important factor will be the co-operation of the trade and others in collecting and selling scrap to maintain steel production.* We in turn pledge that our facilities will be stretched to the very limit—and that our customers will receive all possible assistance. ☆ ☆ ☆ ☆ ☆

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Up-to-date facilities and men trained to meet exacting standards of precision, make the fabricating and machining of large structure weldments standard production at Danly.

The mechanical press crown *left* brought no problem of size to Danly engineers and setup men. Sub-assembly construction permitted several crews to work on the components at the same time. This method cut much costly handling time—avoided inaccuracies in dimension and distortion which frequently occurs in welding of large structures.

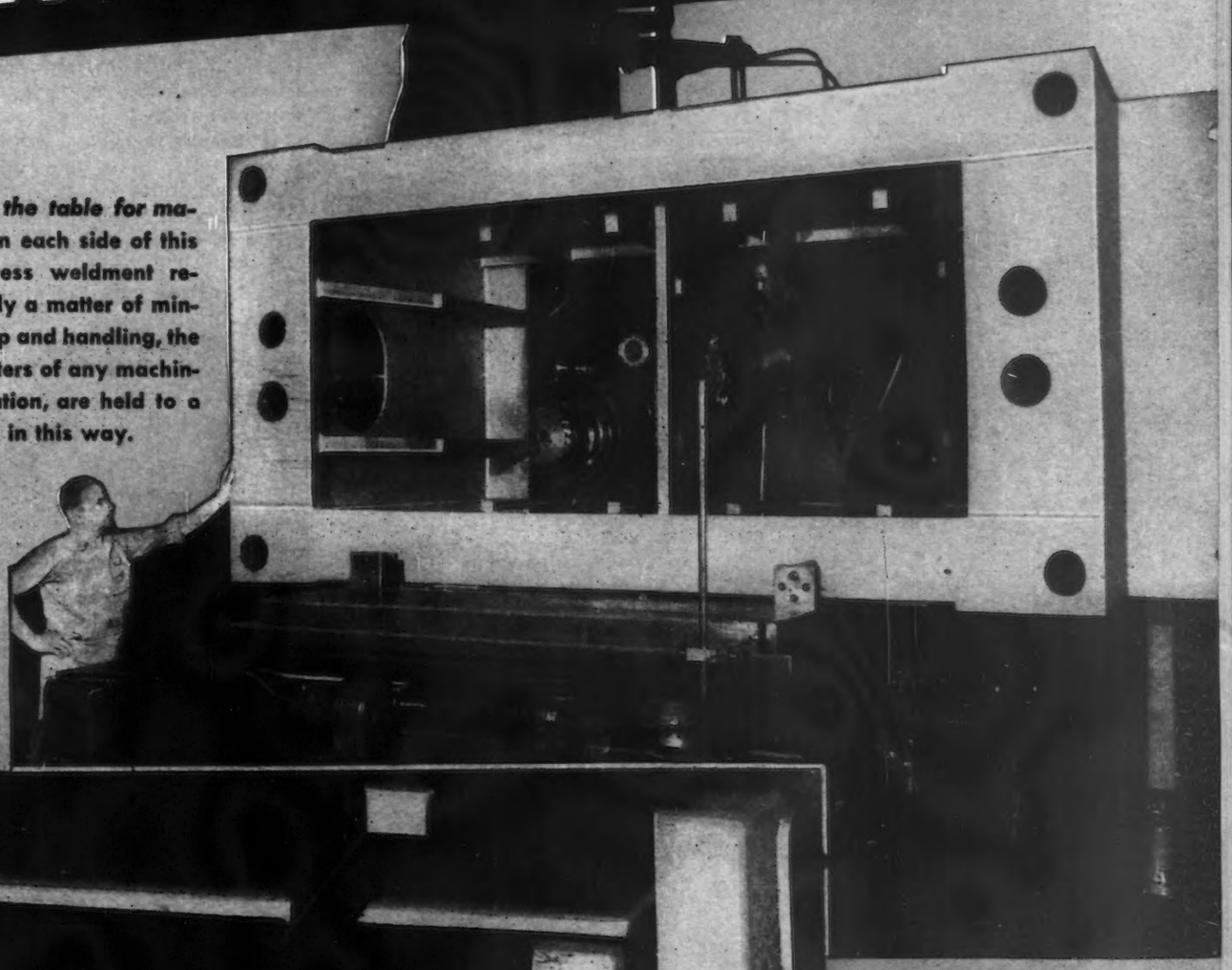
Floor type boring mills *like the one shown at right* simplify exacting machine work. The horizontal indexing table makes it possible to machine each side of the press bed with but a few minutes to index the table and resume work on the next surface. The right-angle boring head *inset* makes possible complete internal milling and boring at any angle through 360 degrees.

DANLYWELD

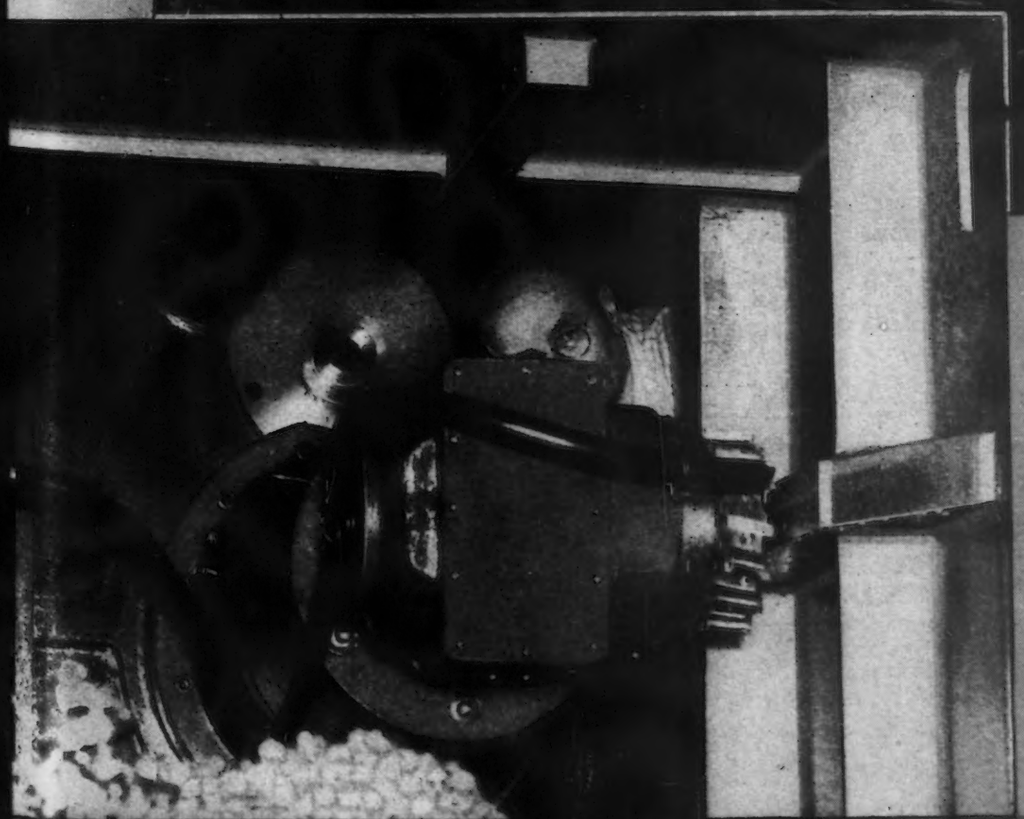
Welded and Machined at Lower Final Cost

DANLY MACHIN...

MACHINING
WELDMENTS BY DANLY



Indexing the table for machining **on each side of this heavy press weldment requires only a matter of minutes. Setup and handling, the time wasters of any machining operation, are held to a minimum in this way.**



This right-angle boring head **runs into deep wells and interiors for machining on surfaces like the side cushion guides on the press bed** ***shown here.*** **Complete internal milling at any angle is possible in one setup.**

SPECIALTIES, INC

Swindell smooth performance . . . maximum heat treating capacities and continuous operation answer today's exacting requirements.

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SWINDELL-DRESSLER Corporation

Designers and Builders of Modern Industrial Furnaces

PITTSBURGH 30, PENNA.

Government War Plant Sales at Snail's Pace In New England Area

Boston

• • • **Disposal of government** owned war plants in New England has been at a snail-pace. Plants located in Connecticut have fetched relatively less than have those in Massachusetts. The one exception in Massachusetts was the purchase by the Lawson Machine Tool Co., Malden, of the plant it operated during the war. The company paid $32,500, whereas the government paid $28,000 for it.

On the other hand the General Electric Co., West Lynn, paid $323,000 for a plant it occupied during the war that cost the government $382,970, and bought also a Fitchburgh plant for $1,200,000 as against the government cost of $1,896,068.

These plants are among the few that have been purchased by firms who operated them during the war. The Boston plant run by the Meisel Press Co. to manufacture gears and costing the government $137,000, sold to a concern making thermometers for $72,766, and the L. W. Guild Co., textiles, bought for $67,500 the Northbridge plant operated during the war by the Raytheon Mfg. Co., this costing the government $99,310.

Buyers of Connecticut plants have struck better bargains with the government than have buyers of Massachusetts properties. The biggest Connecticut bargain was 32 buildings occupied by the Electric Boat Co., Groton. This layout cost the government $5,636,151 and was purchased by the Charles Phizer Co., Brooklyn, for $900,000 for the manufacture of drugs. Thus the buyer paid about 16 pct of the cost to the government.

Another Connecticut bargain was the plant occupied during the war by the High Standard Mfg. Co., Hamden, costing the government $1,174,000 which was purchased by a Meadville, Pa., company, manufacturer of zippers for $801,000.

The American Screw Co., Providence, R. I. bought for $1,750,000 the war-time plant of the United Aircraft organization at Willimantic, Conn. This plant cost the government $2,883,570, and considering the high quality of construction and ideal location is rated one

TOP QUALITY STEELS *Where* TOP QUALITY COUNTS!

ARISTOLOY STEELS

STANDARD STRUCTURAL ALLOY STEELS
BEARING QUALITY STEELS
ALLOY TOOL STEELS
SPECIALTY
NITRALLOY
CARBON TOOL
STAINLESS
MAGNAFLUX-AIRCRAFT QUALITY

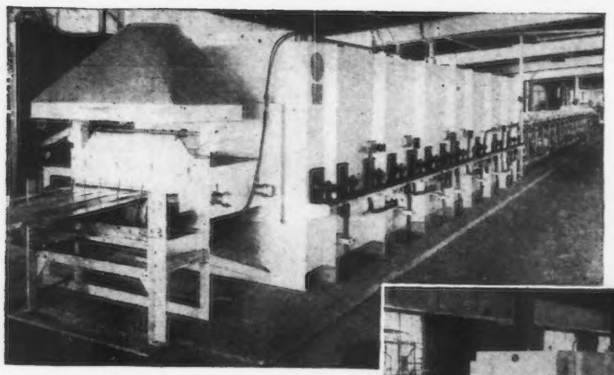
ARISTOLOY ELECTRIC FURNACE ALLOY STEEL is being used by The Thew Shovel Company in the swing shaft of their Lorain-82's and Lorain-41's. They recognize the need for the combination of *precision* and *strength* in this important part.

ARISTOLOY Steels, produced to exacting specifications, will give *your* product *precision* and *strength*. Every heat of ARISTOLOY is carefully checked by our metallurgical and chemical laboratories — including spectrographic analysis.

Your Copperweld representative can help you select the ARISTOLOY Steel which will best fit your product.

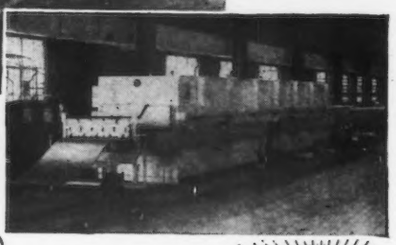
WHEN TOP QUALITY COUNTS... CHOOSE TOP QUALITY ARISTOLOY

COPPERWELD STEEL COMPANY • WARREN, OHIO



This EF installation is bright annealing six parallel strands of steel strip. Handles any width up to 30".

This EF installation handles strip in widths up to 36". Wider sizes available.



EF Furnaces for *Bright Annealing and Normalizing Strip---Continuously*

For Hot or Cold Rolled: High or Low Carbon; or Stainless

Sizes to Handle 1000 to 28,000 lbs. per Hour

Quicker deliveries, shorter annealing time and less material in process . . .

Continuous operation, uniformity of finish and anneal . . .

Elimination of pickling, moderate floor space requirements and low operating costs.

These are some of the advantages of EF continuous controlled atmosphere furnaces for bright annealing and normalizing strip.

The finish and anneal are uniform as the material is annealed in strip form, and every linear foot is therefore subjected to exactly the same temperature and conditions regardless of the tonnage.

The anneal is secured in a few minutes in place of hours . . . requiring less material in process.

Can be built in sizes to handle any width or tonnage required.

We are in position to design and build the size and type best adapted to your plant, product and production requirements.

We solicit your inquiries covering production furnaces for handling strip or other products in any size, shape or form—no job is too large or too unusual.

The Electric Furnace Co., Salem, Ohio

Gas Fired, Oil Fired and Electric Furnaces---For Any Process, Product or Production

Production Furnaces
For Handling Products in Any Size or Shape

FURNACES OIL, GAS or ELECTRIC
For Every Heating and Heat Treating Process

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Annealing
Billet Heating
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Copper Brazing
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We Build the Furnace to Fit Your Job
THE ELECTRIC FURNACE CO.
SALEM, OHIO

For Production Furnaces, For Any Process or Production, Consult
The Electric Furnace Co., Salem, Ohio
No Job Is Too Large or Too Unusual

of the best bargains struck so far in WAA's sales program of surplus plants located in New England.

The nearest thing to a real bargain in Massachusetts was the purchase for $800,000 of the plant it occupied during the war to make rubber goods by the Panther Panco Co., Chelsea. The buying price represented about 20 pct of the cost to the government.

Housing Needs Alters Retrenchment Program To One of Expansion

Buffalo

• • • **American Radiator & Standard Sanitary Corp.** has rescinded its previous announcement that it will curtail operations in its plants here and has now instituted an extensive expansion program that will employ 2000 additional workers and will entail the purchase of new machinery valued at $500,000.

This new program, designed to meet the demands of the building industry, will include stepping up operations through the use of second and third shifts in some departments.

Employment at the Bond and Stamping plants will reach a new peak of 3500 to 4000 workers by October in the production speedup to enable the company to meet a huge order backlog of boilers, radiators and diversified heating equipment.

Highlighting the program is the company's revised decision not to close its malleable and steel plant in Ledger St. This plant will stop making castings, as planned, and become an addition to the stamping plant in Elmwood Ave., Reed declared. The company had intended to sell the property.

The Bond plant, which makes boilers, has 1450 on the current payroll, an increase of 450 since May 1. Employment will be about 2400 by fall.

The Stamping plant, which manufactures water heaters, oil and gas burners, radiator enclosures and other heating units, has approximately 500 on the present payroll, an increase of 200 since May 1. This plant will have about 1200 working by October.

Employees in the malleable and steel plant will be absorbed by the Stamping plant. Only about 200 are now working there.

HEAT TREATED ALLOY STEEL CASTINGS

That's our Dish

Illustrated above is a typical group of coupling boxes and spindles—cast in Pitaloy (a special PSF-developed analysis) and heat treated to 400-500 Brinell on all wearing surfaces. If desired, jobs like these are also cast in carbon steel, and PSF heat treating technique and facilities get results with carbon steel that you'd find very interesting. • Where your problems involve heat treated castings, let us work with you.

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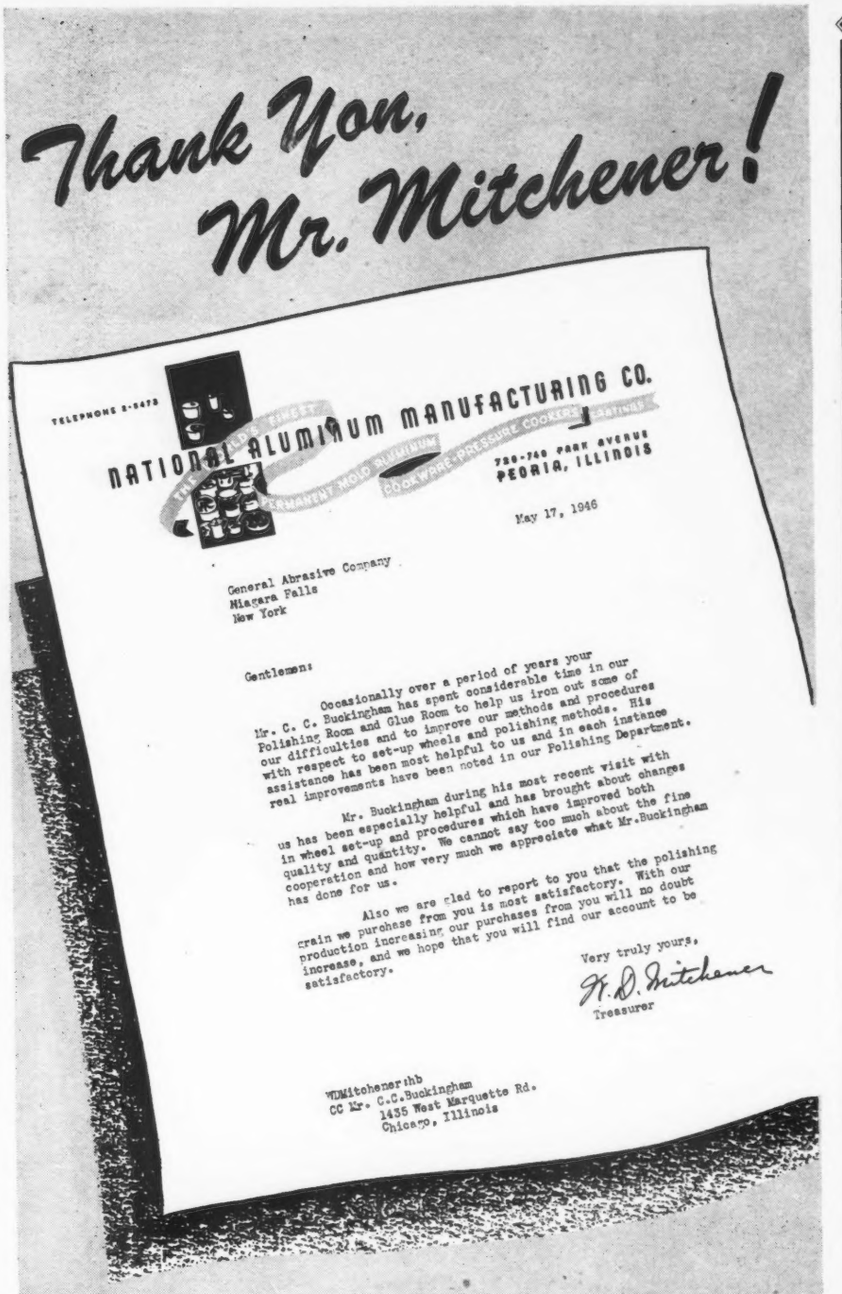
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NATIONAL ALUMINUM MANUFACTURING CO.
720-740 PARK AVENUE
PEORIA, ILLINOIS
May 17, 1946
General Abrasive Company
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Gentlemen:
Occasionally over a period of years your Mr. C. C. Buckingham has spent considerable time in our Polishing Room and Glue Room to help us iron out some of our difficulties and to improve our methods and procedures with respect to set-up wheels and polishing methods. His assistance has been most helpful to us and in each instance real improvements have been noted in our Polishing Department.
Mr. Buckingham during his most recent visit with us has been especially helpful and has brought about changes in wheel set-up and procedures which have improved both quality and quantity. We cannot say too much about the fine cooperation and how very much we appreciate what Mr.Buckingham has done for us.
Also we are glad to report to you that the polishing grain we purchase from you is most satisfactory. With our production increasing our purchases from you will no doubt increase, and we hope that you will find our account to be satisfactory.
Very truly yours,
H. D. Mitchener
Treasurer
WDMitchener:thb
CC Mr. C.C.Buckingham
1435 West Marquette Rd.
Chicago, Illinois

Why not let a LIONITE engineer survey your Polishing Room. There is no obligation.

GENERAL ABRASIVE COMPANY, INC.

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New Approved Dealers Appointed by WAA To Sell Surplus Material

Washington

• • • **Appointment of 118 additional "approved dealers" during the June 1-28 period by WAA brought the total of licensed machine tool representatives for the government to 2512. The 33 WAA regional offices had, as of June 28, an additional 311 applications under review.**

Cumulative sales of machine tools and some production equipment sold by "approved dealers" through June 15 amounted to $77,012,003 (cost to the government), with a return to the government of $36,349,439.

Dealer sales of machine tools for the period June 1-15 amounted to $7,730,478 (cost to the government) and sold for $3,650,758. This represents a sharp drop in sales, 42 pct, as compared with the previous 15-day period May 16-31, when sales amounted to $13,274,977 (cost to the government).

This drop in sales was attributed to a suspension of activities which resulted from a question raised by the Comptroller General's Office as to whether "approved dealer" contracts executed after Mar. 25, 1946, were valid. The appropriation bill effective July 1 removed this question and Lt. Gen. E. B. Gregory, WAA Administrator, accordingly announced that the dealer program would continue as originally set up through the 1947 fiscal year beginning July 1, 1946.

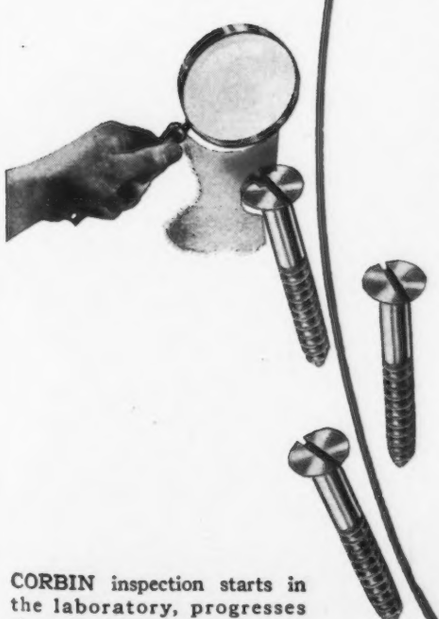
Preliminary figures as of May 31 show an on-hand inventory of machine tools of $689,606,000, including $1.684,000 on lease. This represents an acquisition increase in inventory during this period of approximately $33 million.

A list by regions of the newly appointed "approved dealers" follows:

CLEVELAND

Walker, Robert J., 2206 Chatfield Drive, Cleveland Heights
Forest Machinery Co., 1706 Woodland Ave., NW, Canton, Ohio
Shermor Sales, Inc., 39 W Broad St., Columbus, Ohio
Varland Engineering Co., 2935 Jessamine St., Cincinnati
Kilcorse Machinery Co., 1301 Elm St., Toledo
James C. McNett & Co., 538 N Erie St., Toledo
Eric Bonwitt, 87 S High St., Akron Ohio
Randle Machinery Co., 626 Broadway, Cincinnati
Globe Engineering Co., 205-15 Keith Bldg., Cincinnati
Samuel John Carson, 455 Lora Ave., Youngstown

You can scoop 'em because we pick 'em!



CORBIN inspection starts in the laboratory, progresses through each modern manufacturing process — includes careful bench inspection by trained experts. It pays to give you only the best.

Examine a CORBIN Slotted Wood Screw . . . see the clean, saw-cut slot — the well-formed head centered over the smooth true shank — the deep sharp thread that starts with a needle point . . . You'll see why each CORBIN slips into the wood and turns up tight.

It's easy to make a perfect wood screw: *the real test comes when you turn out a billion.* We've found it necessary to keep our saws and cutters sharp — and to follow up with close inspection.

We think it pays, for this careful manufacture gives you uniform CORBIN Wood Screws . . . enables you to scoop 'em into your assembly lines and drive for profit.

SS-2

CORBIN SCREW DIVISION
The American Hardware Corporation
NEW BRITAIN • CONNECTICUT
Warehouses:
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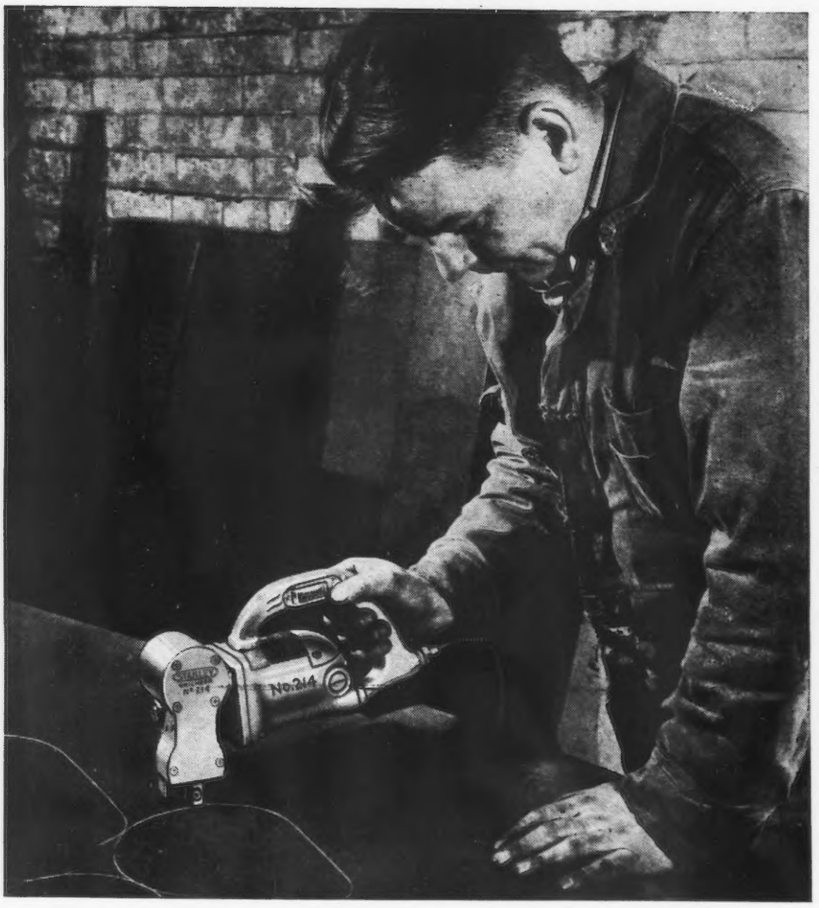
CORBIN REGULAR SLOTTED **Screws**



Short Cut from Plans to Products

STANLEY UNISHEARS are friends-in-need for manufacturing plants where new ideas must be translated from plans to products quickly, and at minimum cost. These fast, powerful tools are cost-cutters for the fabrication of models, sheet metal assemblies, safety devices and for short production runs.

Unishears cut curves, angles and inside holes with hairline accuracy. Five different portable models cut sheet metal up to 8 gauge hot-rolled steel, other materials in proportion. Stationary models will cut up to 10 gauge hot-rolled steel. Ask your distributor for complete information. Stanley Electric Tools, 173 Elm Street, New Britain, Connecticut.

STANLEY

Trade Mark

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NEWS OF INDUSTRY

Roy D. Finnell, 1343 Thatcher Drive, Toledo
Gassman & Associates, 1404 N.B.C. Bldg., Cleveland
J. F. Monesmith Machinery Co., 145 Warren St., Dayton
Valley Engineering Sales Co., 745 E Maple St., Miamisburg, Ohio
J. L. Jones Co., 513 Bakewell St., Covington, Ky.

DETROIT

Hoosier Equipment Co., 1040 W Grand Blvd., Detroit
Utility & Industrial Supply Co., 921 E Michigan Ave., Jackson, Mich.
Micro Parts Co., 8104 Tireman, Detroit
Platte Machinery Sales Co., Peter J., 28710 E Jefferson Ave., St. Clair Shores, Mich.
Reagen Machine Tool Sales Co., 711 W Alexandrine, Detroit
Fitzgerald, Robert E., 600 Michigan Bldg., Detroit
Donat A. Gauthier, 7408 Poe St., Detroit
Leo J. Kujawa, 15435 Regina Allen Park, Dearborn
Machine Rebuilding Co., 2742 Chene St., Detroit
Sam's Machinery, 5257 Hecla, Detroit
Yale Machine Tool Co., 3240 Glynn Court, Detroit
Detrex Corp., 13005 Hillview Ave., Detroit
Evans Machine Tool Sales, 15500 Lauder, Detroit
George W. Hofmann, Hotel Fort Shelby, Rm. 444, Detroit
Sheldon Keasey, 23 Hudson Ave., Pontiac, Mich.
Machining & Inspection, 308 Boulevard Bldg., 7310 Woodward Ave., Detroit

HELENA

Gerald Honadel, 209 Masonic Temple, Havre, Mont.
The Kirkpatrick Co., 830 Utah Ave., Butte, Mont.

HOUSTON

Aitken-Furby Co., 800 Calder, P. O. Box 3387, Beaumont, Tex.

LOUISVILLE

Hoosier Hardware Co., West Side Square, Paoli, Ind.
A. C. Davis & Lee H. Davis, Manufacturers' Agents, 233 E Market St., Louisville
John P. Davenport, 126 N Galt Ave., Louisville
Shobe's Service Shop, P. O. Box 56, Lewisport, Ky.
Construction Equipment, 806 Kentucky Home Life Bldg., Louisville

NASHVILLE

Auto Supply Co., 300 S First St., Nashville, Tenn.
Nixon Machinery, 1300 Carter St., P. O. Box 149, Chattanooga, Tenn.
Glazer Steel Corp., 520-610 Chamberlain St., Knoxville, Tenn.

NEW ORLEANS

Oliver H. Van Horn Co., Inc., 228 Spring St., Shreveport, La.
Trosclair Woodworking Machinery, 317-319 N Diamond St., New Orleans

NEW YORK

Harry Z. Rosenberg, Jr., Larkin Terminal Bldg., 183 Van Rensselaer St., Buffalo
Ruderman Machinery Co., 80 W Main St., Gouverneur, N. Y.
A. V. Wiggins & Co., 328 W Fayette St., Syracuse, N. Y.
Alfred Zipser, 140 75th St., Brooklyn
Arrow Engineering Co., 305 W 54th St., New York
Stuart M. Heagy, 91-40 Lamont Ave., Elmhurst, Long Island, N. Y.
Joseph A. Cummings, Jr., 24 E 35th St., New York
Hegeman & Hart, 218 Fulton St., New York
MacBeth, W. E., 489 Fifth Ave., New York
Commercial Machinery Co., Inc., 213 W 53rd St., New York
P. S. Murphy & Co., 512 Fifth Ave., New York
Petersen Tool & Die Wks., 100-102 Innis St., Port Richmond, Staten Island, N. Y.
Richard Seaman, Inc., 790 Broad St., Newark, N. J.
Seville Machine Tools, 450 Seventh Ave., New York
V. Trading Co., 1947 Narragansett Ave., Bronx, New York
Morris Abrams, Inc., 196 Centre St., New York
American Sales & Engineering Co., 488-92 Walden Ave., Buffalo
Cinrock Machinery, Inc., 744 Broad St., Newark, N. J.
Wm. J. Conway, 25 Broad St., Rm 735, New York

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ENGINEERED FOR THE JOB

MORE THAN 50 YEARS of Service

THEY HOLD THE EDGE

because they are tempered and ground for your particular needs

Wapakoneta Shear Blades are made and heat treated, ***not*** to meet some universal standard of our own, but to best fill each customer's requirements... That is why Wapakoneta Shear Blades stand up longer on the job and cut more tonnage.

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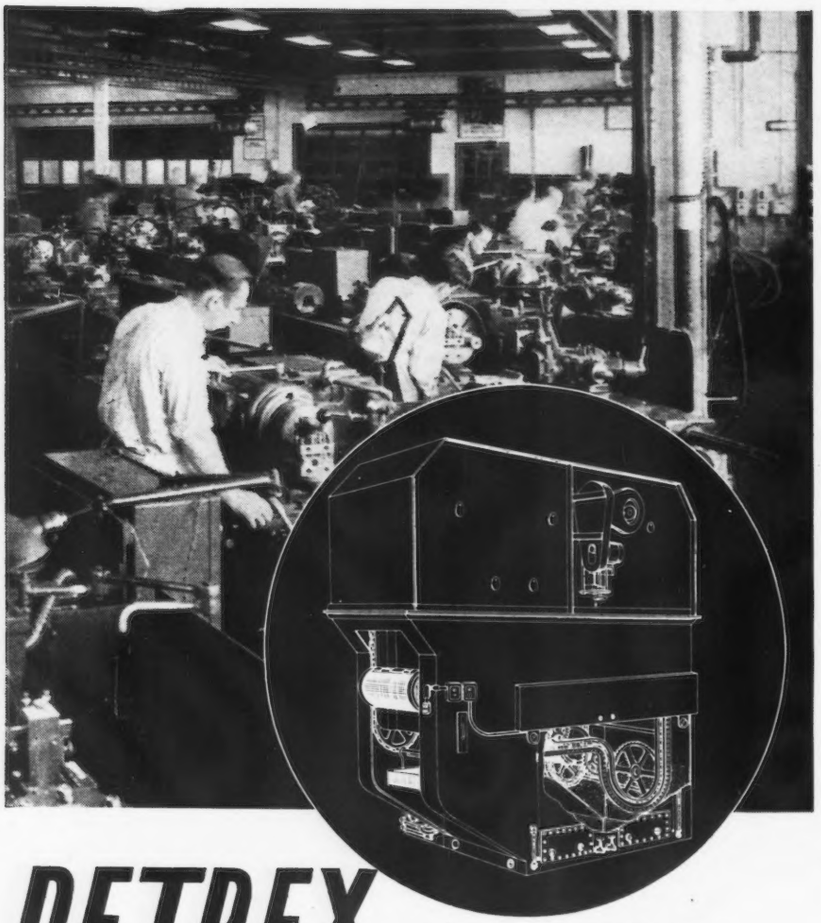
A DEGREASER BUILT TO FIT *SMALL SHOP* REQUIREMENTS



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It had to be small, yet flexible—and built with the same engineering quality and dexterity which is a part of all Detrex equipment.

The overall height easily fits ceiling limitations in the smaller shops, while the degreaser itself occupies less than 75 square feet of floor space. Flexible, the "750" may be supplied with rotary and flat baskets or rotary baskets alone, depending upon individual production requirements. To facilitate loading and unloading, a solenoid brake stops each rotary basket at a predetermined location.

Perm-A-Clor and Triad solvents are recommended for use in the 1 DC-750. For information, call a Detrex field representative today, or write direct to the address below.

DETREX Corporation
DETROIT 32, MICH.
E-127

NEWS OF INDUSTRY

Crandall, Barker & Collins, 45 E Putnam Ave., Greenwich, Conn.
Willard C. Darragh, 175 Clinton Ave., Newark, N. J.
Simon Finkelstein, 230 Riverside Drive, New York
Charles D. Koch, 42 W 58th St., New York
Lancoll Corp., 11 Park Place, New York
Wm. C. Hyatt, 370 Lexington Ave., New York
Frank O. Brown, 45 Astor Place, New York
Kunen Engineering Co., 17 W 42nd St., New York
Victor Brook Sales Engineer, 171 Rockingham St., Rochester, N. Y.
William P. Asay, 290 Seneca Parkway, Rochester, N. Y.
Kenneth C. Dick, 53 Park Place New York
William S. Preyer, 112 Anderson Place, Buffalo
Barnard S. Bertrand, 29-28 41st Ave., Long Island City, N. Y.
Lane Engineering Services, 880 Central Ave., Scarsdale, N. Y.
L. V. Smith, 49 W 32nd St., New York
Newark Machinery, 59 Edison Place, Newark, N. J.
Rudolph Moller, Jr., 700 Bergen St., Newark, N. J.
J. J. Burke, 5705 New Utrech Ave., Brooklyn
A. J. Anderson, c/o McRoberts & Tegtmeyer, 37 Wall St., New York
Dayton Metal Products, Inc., 415-425 Barretto St., New York
Edward M. Foster, c/o F. M. Alexander, Rm. 4D, 34-31 78th St., Jackson Heights, N. Y.
William J. O'Brien, 175-05 Wexford Terrace, Jamaica, N. Y.

OKLAHOMA CITY

Carlson Saw & Equipment Co., 818 Braniff Bldg., Oklahoma City, Okla.

RICHMOND, VA.

Walke Co., Henry, 407 Union St., Norfolk, Va.
Allen Mfg. Co., 1521 Rhode Island Ave., NW, Washington, D. C.
Harold Crookes Agency, 1124 Earle Bldg., Washington, D. C.
Russell Jondreau, 419 Munsey Bldg., Washington, D. C.
York Wilson & Co., 2034 16th St., NW, Washington, D. C.
Viereck-Summerbell & Co., 1704 17th St., NW, Washington, D. C.
Export Trading Co., 708 Mutual Bldg., Richmond, Va.
Harris Machine Co., 107 King St., Alexandria, Va.
E. G. Watson, 801 Bowen Bldg., Washington, D. C.
E. John Kennedy, Stansbury Manor, Middle River, Maryland, (Baltimore 20)
Metals Management, Inc., 601 19th St., NW, Washington, D. C.
Contractors Supply Co., First and Payne Sts., Alexandria, Va.

ST. LOUIS

David J. Alpirn, 6261 Clemens, University City, Mo.
Midvale Mining & Mfg., 2732 La Salle St., St. Louis
Jenkin-Guerin, Inc., 1322-24 Merchant St., St. Louis
Branstetter Tool & Equipment Co., 705 Chestnut St., St. Louis
Municipal Tool & Machinery Co., 2311 Franklin Ave., St. Louis
Sternoff Metals & Iron Works, 6431 Airport Way, Seattle
Washington Machinery & Storage Co., 8329 E Marginal Way, Seattle, Wash.
Wm. H. Payne Co., 1923 First Ave., Seattle

SAN ANTONIO, TEX.

Nelson Tie Co., Seguin, Tex.
Fred Felty, Maltsberger Road, San Antonio, Tex.
C. M. Kelley, 623 Hoover St., San Antonio, Tex.

SAN FRANCISCO

Delta Equipment Agency, 2312 Broadway, Oakland, Cal.
Riley Precision Tool Co., 1135 Mission St., San Francisco
Republic Sales, Route 8, Box 1305, Sacramento, Cal.
Karl L. Bues, 4267 Detroit Ave., Oakland 2, Cal.
Casey-Newhall Corp., 2026 Lombard St., San Francisco
Griff Scott, 57 Post St., San Francisco
Nibley & Walk, 340 Pine St., San Francisco

SPOKANE

Western Equipment Co., 250 Main St., Box 2196, Spokane
Wiley Construction Co., 1105 N Ninth St., Walla Walla, Wash.

. . . with only 2 light coats

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Recent production experience with Titanium enameling iron demonstrates . . . more clearly than ever before . . . the unique advantages of this new advance in the enameling industry.

With Titanium enameling iron—the cover coat, in white or color, is satisfactorily applied directly to the base metal. Ground coats are usually unnecessary when proper shop conditions are observed. As a result, production is doubled, often tripled—capacity boosted—and substantial savings effected.

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Eliminates outside piping...

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MODEL 11020A FLANGE MOUNTED INTERNAL DISCHARGE

Designed to fit into small space and eliminate outside piping, patented Gusher Flange Mounted Internal Discharge Coolant Pumps can be installed on the machine base for improved performance and appearance.

Available in a variety of models, long or short, with discharge through center of intake or to right or left of intake in flange, 1/10 to 2 HP motors, they contain all the features which have made Gusher Pumps universally accepted throughout the machine tool industry.

Write now for New Condensed Catalog

THE RUTHMAN MACHINERY CO.

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THE "GUSHER"

A MODERN PUMP FOR MODERN MACHINE TOOLS

Shipments in '45 Of Steel Castings Topped 1.9 Million Net Tons

Washington

• • • **Total shipments** of steel castings during 1945 amounted to 1,942,477 short tons, according to a report released by the Bureau of the Census. Of these shipments 1,434,473 tons, or 74 pct, were of carbon steel and 508,004 tons, or 26 pct, were of alloy steel. A little under one-half of the total shipments, or 900,600 tons, were produced in electric furnaces, and 1,041,877 tons were produced in other types of furnaces.

More than three-quarters of all the steel castings shipped during 1945, or 1,484,957 tons, were for sale to the trade. The other 457,520 tons were produced for the manufacturers' own use.

Peak monthly shipments of steel castings during the year were reached in March when 222,591 tons were shipped. Immediately after VE-Day a sharp decline in shipments set in, and in December the shipments amounted to 115,239 tons, only slightly more than half of the March total. The decline in shipments of alloy steel castings was proportionately much greater than the decline in carbon steel castings. Whereas the December shipments of carbon steel castings showed a decline of 40 pct from the March figure, shipments of alloy steel castings dropped over 60 pct.

The relative decline in the volume of unfilled orders on the books of steel foundries at the end of each month was even greater than the decline in the monthly shipments. In each of the first 4 months of the year unfilled orders totaled approximately 1,000,000 tons. By the end of December the backlog of orders had dropped to 434,287 tons, 59 pct under the March peak.

During 1945 steel castings were produced in 37 states. Most of the steel foundries are concentrated in the Middle Atlantic and east North Central States. Foundries located in these two geographic divisions shipped 1,541,483 tons during the year, or 79 pct of all steel castings shipped.

Pennsylvania foundries shipped 510,679 tons during the year, considerably more than any state.

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DUCTILE . . . . .

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Some of your tubing problems may be profitably solved through the use of Globeiron Seamless Tubing. Globe engineers, Globe laboratory facilities are at your service. Write for Bulletins 109A and 113.

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(Generator Housing)

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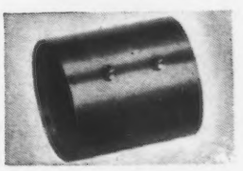

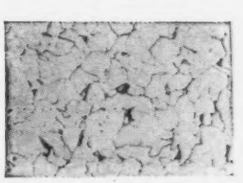

Under the microscope (mag. 200x Nital Etch) Globeiron shows a uniform structure of almost pure ferrite with only occasional patches of pearlite.

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★ MECHANICAL TUBING
★ CONDENSER & HEAT EXCHANGER TUBES ★ GLOBEIRON HIGH PURITY IRON SEAMLESS TUBES
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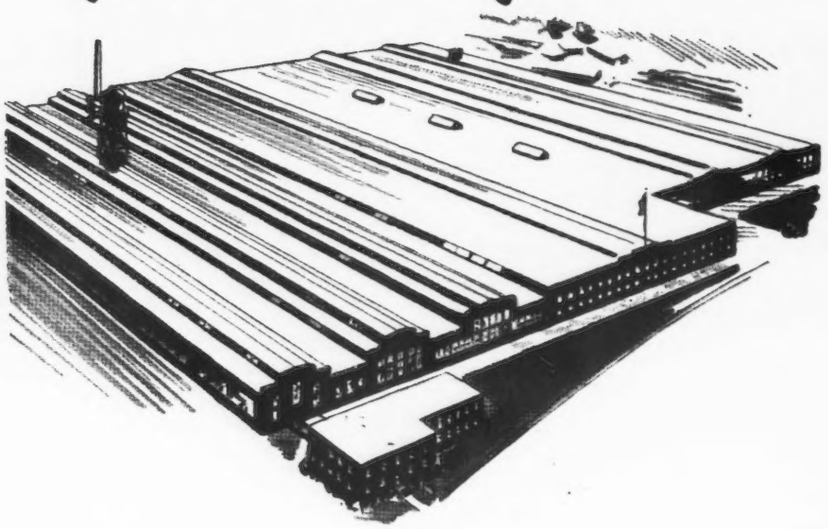

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Thompson Named Chief Of Metallurgy Section

Washington

• • • **Dr. John G. Thompson** has been appointed Chief of the Metallurgy Div. at the National Bureau of Standards, it was announced recently by Dr. E. U. Condon, Director of the Bureau. Dr. Thompson has been chief of the Bureau's Chemical Metallurgy Section since 1930 and assistant chief of the division which he now heads since 1942.

Dr. John G. Thompson

Dr. Thompson organized and directed the investigations at the Bureau on the metallurgy of uranium, from the beginning of the project through all its changes in direction. Among other wartime activities with which he was connected was a study of aluminum and beryllium for use in airplane engines. He has also been actively identified with studies of "pure iron," special refractories for high-temperature metallurgical work, and effects of gases in metals.

National Tube Expands Lorain and Gary Plants

Pittsburgh

• • • **An extensive program** of new facilities at the plants of National Tube Co., at Lorain, Ohio, and Gary, to enable that company better to meet the estimated future demands for steel pipe was announced by C. R. Cox, president.

An entire new bessemer steel plant, including three bessemer converters and all necessary auxiliary equipment, will be installed at Lorain to replace the existing bessemer steel facilities in that city. The new plant will increase National Tube's ingot capacity at Lorain from 1,884,000 tons to approximately 2,200,000 tons a year. In recent years there have been many improvements in the methods of producing bessemer steel, resulting in a strong market demand for products made from this type of steel.

The improvements at Lorain

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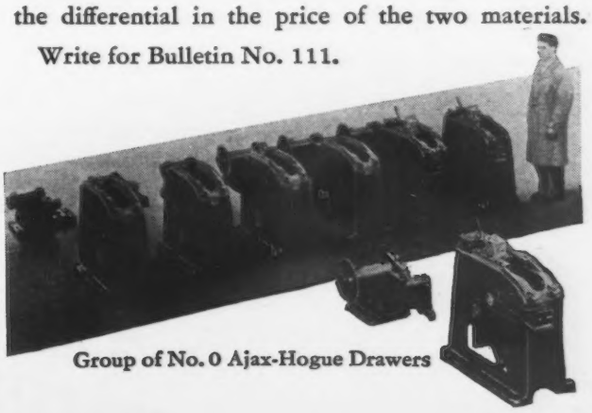
The Ajax-Hogue Drawers are built in five sizes for wire diameters of ¼ to ¾ inch. Hot rolled stock is used instead of cold drawn wire, with the saving of the differential in the price of the two materials.

Write for Bulletin No. 111.



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also include the installation of an additional seamless mill to produce pipe in the smaller sizes, additions and improvements in the equipment for the production of pipe and boiler tubes; a blooming mill; a bar mill and a billet mill replacing two existing blooming mills and a combination rail mill. These developments will increase the pipe capacity of the Lorain works to the extent of approximately 150,000 tons annually, or about 15 pct.

At the Gary plant where certain government-owned equipment installed during the war was recently purchased by National Tube, an additional seamless mill for the production of small size pipe will be installed, as well as electric welding equipment for producing tubing up to 5-in. outside diameter. These new facilities, when integrated with presently-owned equipment, will increase National Tube's pipe and tube capacity at Gary about 170,000 tons a year.

Completion of these two projects, soon scheduled to start, will require about two years, Mr. Cox estimated. It is expected that the new facilities, when completed and in operation, will provide additional employment at both Lorain and Gary.

Enters Into Agreement With British Industry

Cleveland

• • • **Arthur G. McKee & Co.** has entered into a working arrangement with Head, Wrightson & Co., engineers and fabricators in the British iron and steel industry, located in Stockton-on-Tees, England, according to the company. The association covers possible iron and steel work in the British Isles.

According to the stockholders' report, Arthur G. McKee & Co. in addition to domestic contracts in process, is engaged in work in Canada, Mexico, Peru, the Middle East, India and China.

William A. Haven, vice-president of the company, has been in India and China for several months with members of the organization on preliminary work looking to plant construction in those countries. McKee has not re-established offices in Europe, however.

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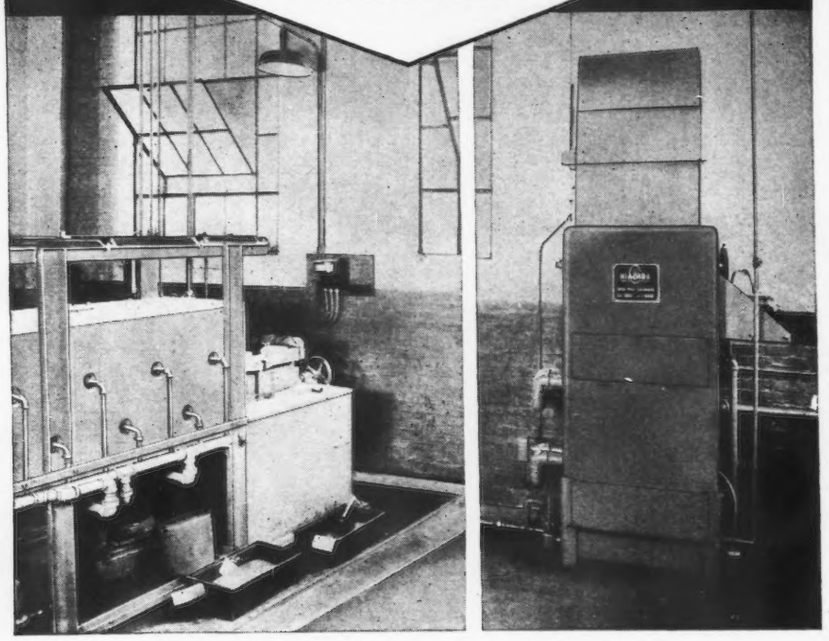

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Metal Congress Exhibit Space 86 Pct Taken

Cleveland

• • • **While opening** of the 28th annual National Metal Congress and Exposition is more than four months away, 86 pct of the exhibit space has already been sold and specific areas assigned to 275 exhibitors for the 5-day event which will be held in Atlantic City's municipal auditorium beginning Nov. 18, according to W. H. Eisenman, managing director of the event.

Mr. Eisenman said that floor plans had previously been sent only to former exhibitors in preceding metal shows, but in view of the interest shown by many others, floor plans had been sent to them. He pointed out that space is moving fast, but priority is given former exhibitors, and then opened up and floor plans sent to others interested.

According to advance program of participating societies, many technical papers of interest and value will be presented and Mr. Eisenman has already received more than double the number of papers previously received for consideration with a view to presentation at the show. A number of production and manufacturing techniques evolved during the past 5 yr and used entirely on war production have been released from Army and Navy restricted lists and will be shown at the show.

Carriers Ask Higher Rates on Coal and Coke

Washington

• • • **Railroads have petitioned** the Interstate Commerce Commission to amend its recent interim rate increase decision by increasing rates on bituminous and anthracite coal, coke and lignite 15¢ per net ton and 17¢ per gross ton. The carriers asked that the increases be made effective upon one day's notice. The recent increases went into effect on July 1. These increases were 6¢ per net ton or 7¢ per gross ton on rates of $1 per ton or less and 8¢ per net ton or 9¢ per gross ton on rates in excess of $1 per ton.

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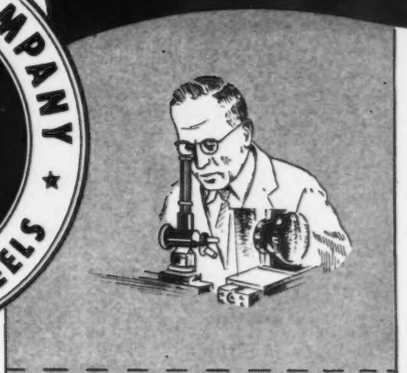

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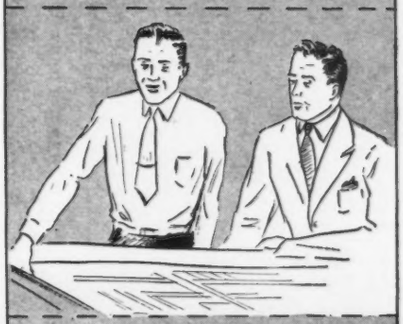

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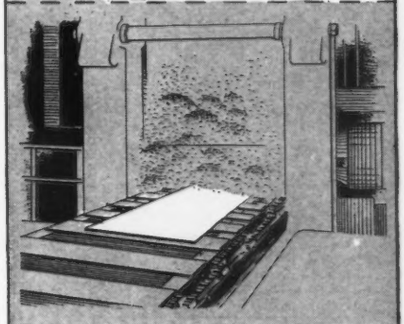

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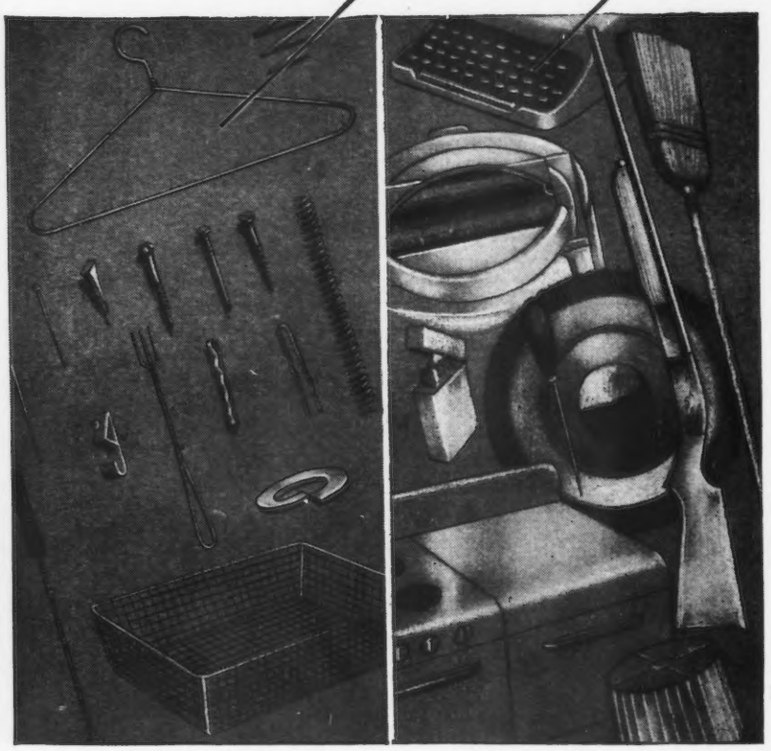

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Justice Dept. Indicts Vanadium Companies, Charging Monopoly

Washington

• • • **Monopolization and price** fixing in the vanadium industry were charged against six corporations and five individuals in a criminal indictment by a Federal Grand Jury at Denver on June 27. In announcing this action, Attorney General Tom C. Clark said that the case is important in the Justice Dept.'s program to eliminate restraints and monopolies in America's basic industries in violation of the Sherman Anti-Trust Act.

The defendants, all from New York excepting one, are as follows:

Union Carbide & Carbon Corp.; United States Vanadium Corp. (a wholly-owned subsidiary of Union Carbide & Carbon Corp.); Electro Metallurgical Co. (a wholly-owned subsidiary of Union Carbide & Carbon Corp.); Electro Metallurgical Sales Corp. (a wholly-owned subsidiary of Union Carbide & Carbon Corp.); Electro Metallurgical Co. of Canada, Ltd. (a wholly-owned subsidiary of Union Carbide & Carbon Corp.); Vanadium Corp. of America.

The five individuals indicted were:

J. R. Van Fleet, president of United States Vanadium Corp.; Blair Burwell, vice-president of United States Vanadium Corp.; W. G. Haldane, vice-president of United States Vanadium Corp.; E. D. Bransome, president of Vanadium Corp. of America; F. F. Kett, general manager of the Mining Division of Vanadium Corp. of America.

The indictment is in two counts. One charges monopolization of interstate and foreign trade and commerce in ferrovanadium, vanadium and vanadium bearing ores. The other charges price fixing in the sale of vanadium oxide and ferrovanadium and the purchase of vanadium bearing ore.

It is charged that Union Carbide & Carbon Corp., and Vanadium Corp. of America control about 95 pct of the commercially available vanadium-bearing ore deposits. Between them, it is alleged, they control 99 pct of all the vanadium oxide

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Using Frasse "Shelby" seamless tubing, the Haines Products Co. has produced more than 3½ million piston pins illustrated. These pins are cut off, chamfered, rough ground, slotted, drilled and counter-sunk. After case hardening, each pin is semi-finish and finish ground, and finally lapped.

Millions of pins — sized to a tolerance of under 1/10000", one thirtieth the diameter of a human hair! Starting from a uniform seamless tube, the latter stages of grinding and lapping remove the remaining .004", with each stage gauged electrically. Final finish on each piece is held between 2 and 3 micro inches — a quality story possible only with quality tubing to begin with.

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For Frasse is a specialist in tubing—and from 50 years of tube warehousing, *knows* tubing. Frasse stocks of mechanical tubing alone range from 3/32" all the way up to 10½" O. D. — not to mention the alloy tubing, condenser tubing, or stainless.

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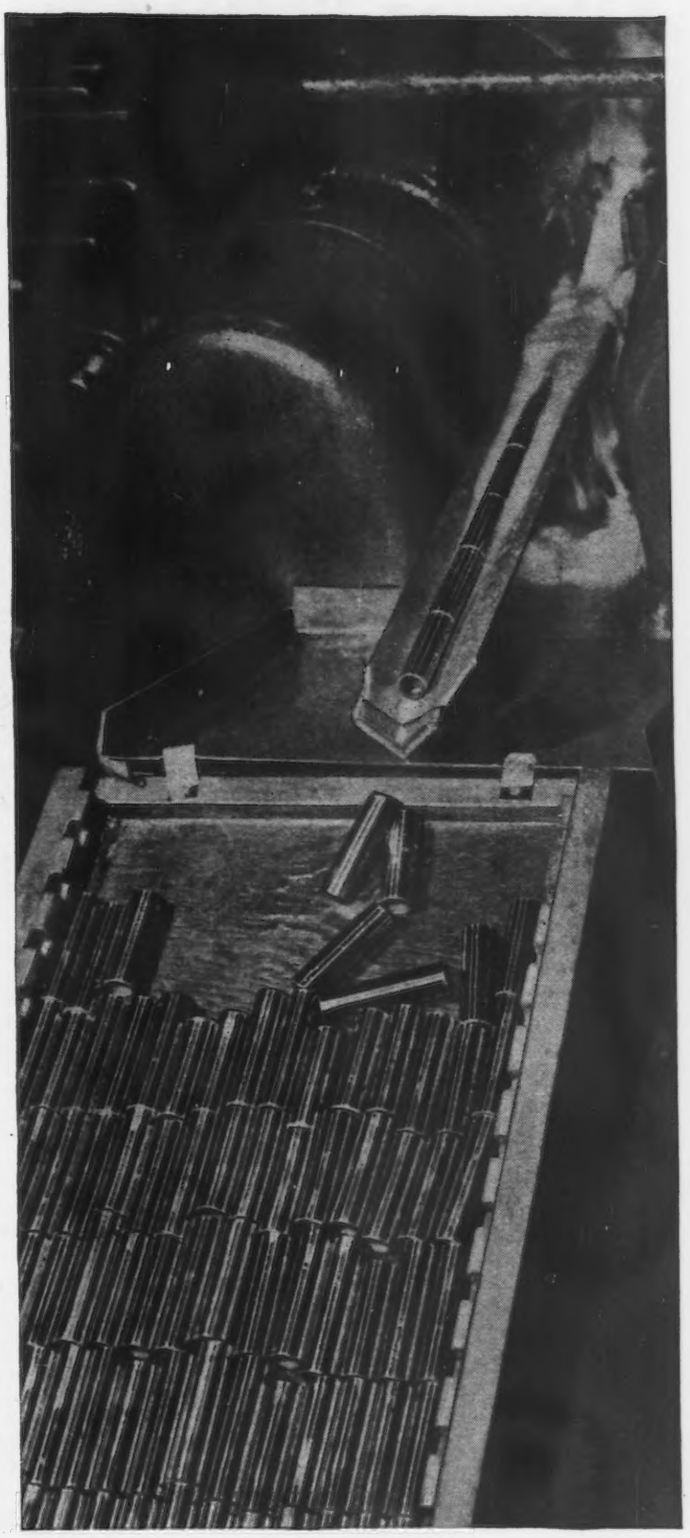

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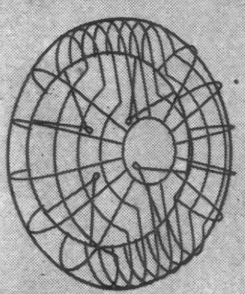

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"As a result of the conspiracy as charged in the indictment, independent vanadium ore miners in the states of Colorado, Utah, New Mexico and Arizona have been placed completely at the mercy of the defendants," said Wendell Berge, Assistant Attorney General in charge of the anti-trust division.

The indictment also charges that the United States Vanadium Corp. utilized its position as agent of the Metals Reserve Co. during 1942 and 1944 to eliminate competition from small oxide mills in Colorado and Utah and to promote the acquisition by the defendants of vanadium bearing deposits. It also charges that the Electro Metallurgical Co. of Canada used its position as agent for the Canadian Dept. of Munitions and Supplies to prevent defendants' competitors from selling ferrovanadium and vanadium oxide for export to Canada.

Lester Engineering To Reorganize Division

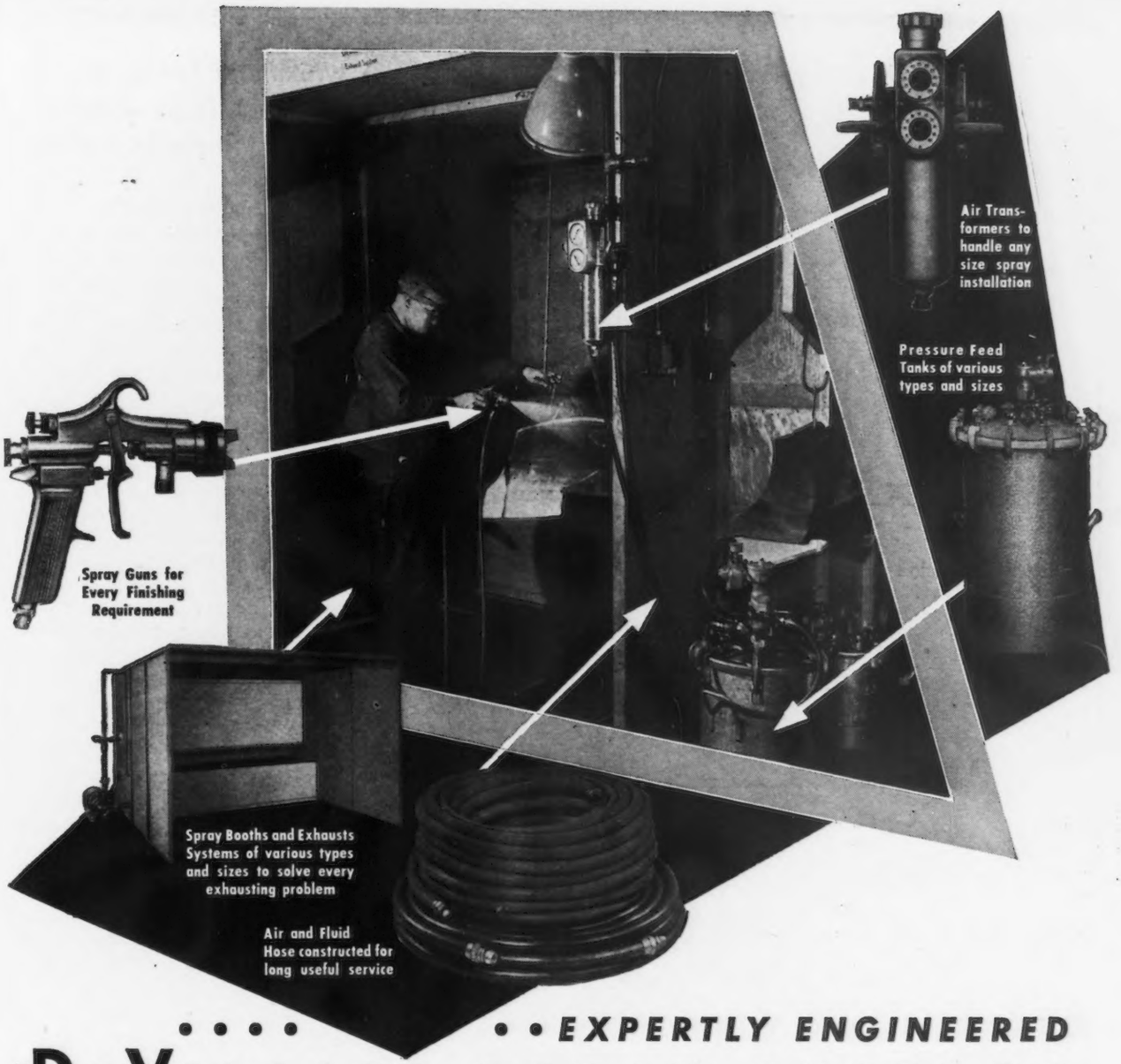
Cleveland

• • • **Reorganization** of the Tool and Die Division of Lester Engineering Co. under the name of Lester-Aetna Die Co., and the moving of plant facilities to Warren, Ohio, have been announced by Nathan Lester, president of the new company.

Nathan Lester

Facilities at the new location have been considerably expanded, both in personnel and tool room equipment, offering the trade complete engineering and manufacturing service for both die casting dies and plastic molds. The Lester-Aetna Die Co. is jointly owned by Lester Engineering Co., Cleveland and Aetna-Standard Engineering Co., Warren. Officers of the new company, other than Mr. Lester are: H. Gerald Coffey, vice-president, D. White, vice-president and Lloyd L. Dalbey, secretary-treasurer.

No change has been made in the organization and basic operations of Lester Engineering Co.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Bituminous Research Group Holds Meeting; Reelects Directors

Pittsburgh

• • • **Intensive research,** which is providing solutions for many of the bituminous coal industry's problems, received special attention last week in Columbus, Ohio, during the annual meeting of Bituminous Coal Research, Inc., held recently.

Fifteen speakers reported the accomplishments that science and technology are making possible in the improved utilization of bituminous coal as approximately 200 coal company executives and engineers assembled for the first meeting. Howard N. Eavenson of this city, president of BCR, presided. He announced that subscribers of the research agency had voted to set up BCR as a non-stock, non-profit corporation. The subscribers then reelected seven members of the board of directors, as follows, after learning that National Coal Assn. previously had named eight directors:

Mr. Eavenson, Pittsburgh; B. R. Gebhart, Chicago, vice president, Chicago, Wilmington & Franklin Coal Co.; W. C. Hull, Cleveland, vice president, Chesapeake and Ohio Ry. Co.; J. B. Morrow, Pittsburgh, vice president, Pittsburgh Consolidation Coal Co.; M. L. Patton, Cincinnati, vice president, Truax-Traer Coal Co.; K. A. Spencer, Kansas City, president, Pittsburg & Midway Coal Mining Co.; and R. D. Stockdale, Columbus, president, Red Jacket Coal Sales Co.

Those who had already been elected, having been named by NCA, were E. H. Davis, Columbus, president, New York Coal Co.; H. A. Glover, Huntington, W. Va., vice president, Island Creek Coal Sales Co.; Ralph E. Jamison, Greensburg, Pa., president, Jamison Coal and Coke Co.; S. S. Nichols, New York City, vice president, C. H. Sprague & Son Co.; D. H. Pape, Monarch, Wyo., president, Sheridan-Wyoming Coal Co.; C. J. Potter, Indiana, Pa., assistant to president, Rochester & Pittsburgh Coal Co.; R. H. Sherwood, Indianapolis, president, Central Indiana Coal Co.; and Robert L. Stearns, Jr., Stearns, Ky., vice

president, Stearns Coal and Lumber Co.

BCR officers, as follows, were reelected by the board in the afternoon, following the subscribers' meeting:

Howard N. Eavenson, president; R. H. Sherwood, J. B. Morrow and Dr. Harold J. Rose, vice presidents; C. A. Reed, Washington, D. C., secretary; M. L. Garvey, Washington, treasurer; and J. F. Hanley, Washington, assistant secretary and treasurer.

The BCR staff at Pittsburgh, in addition to Dr. Rose, director of research, includes Elmer R. Kaiser, assistant to president and assistant director of research; T. A. Day, special representative; William S. Major, development engineer; and Carl S. Westerberg, technical information service.

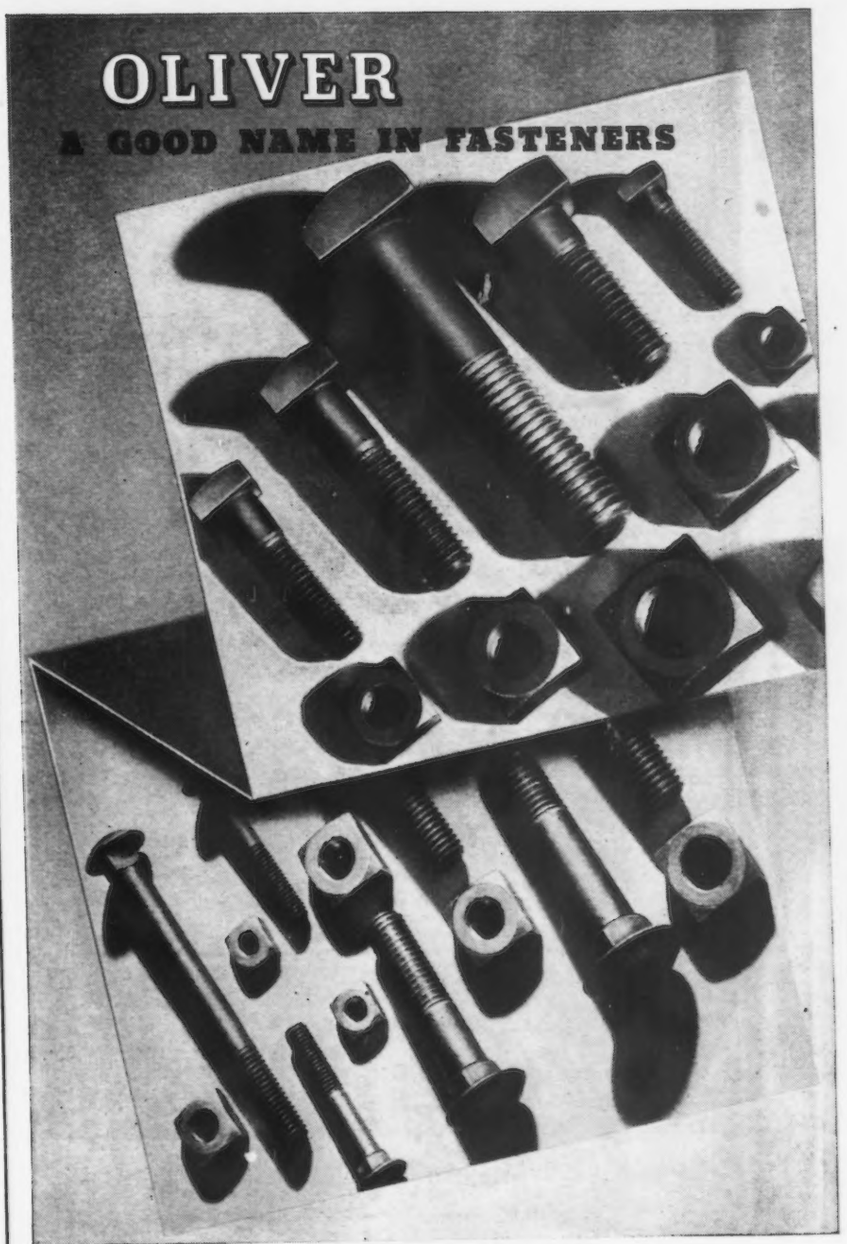
Dr. Harold J. Rose described the scientific achievements and activities of the organization that is now investing $375,000 annually in development work to make bituminous coal a better source of heat and energy. Dr. Rose, who is vice president and director of research for BCR, stated that three laboratories, including Battelle Memorial Institute of Columbus, Ohio, are conducting research under BCR's general program.

"Contracts have been signed with a fourth," Dr. Rose added. "Altogether, a total of 40 projects are under way."

The director also stated that particular emphasis is being given to smokeless methods of utilizing coal in houses and industrial plants and to expand investigational work on coal-fired railroad engines. Every effort is being made, he said, to retain the railroad fuel market for coal through research, and to hold home heating business.

E. R. Kaiser, BCR's assistant director of research, outlined the administrative and engineering activities of the agency's Pittsburgh office.

Other speakers were Julian E. Tobey of New York City, chairman of the BCR technical advisory committee, and H. A. Glover of Huntington, W. Va., chairman of the agency's sales advisory committee. The former, a nationally known fuel engineer, outlined the "must" items that require immediate attention from the scientists retained by the coal industry, including im-



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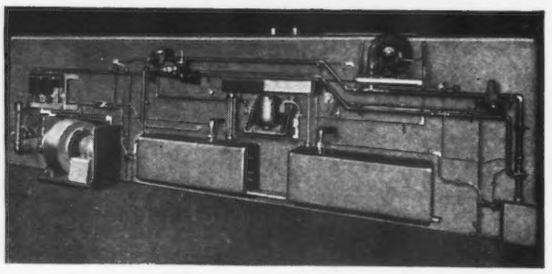

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proved equipment for home consumption of solid fuel and more compact stoker-fired boilers for industrial use. The latter, a prominent coal sales executive, pointed out that research is needed to improve coal-burning equipment and provide the tools with which a recently announced national coal heating service can build ready acceptance of solid fuel by the heat-buying public.

J. I. Yellott of Baltimore, described the research acivities of the BCR locomotive development committee. This group is developing a coal-fired, gas turbine to provide a new form of motive power for railroad locomotives. He was followed by Dr. H. H. Lowry, director of the coal research laboratory, Carnegie Institute of Technology of this city. The latter described the chemical studies under way which ultimately will create new, useful products from coal as well as improve combustion and gasification processes.

Technicians from the Fuels Div., Battelle Memorial Institute, Columbus, Ohio, headed by Ralph A. Sherman, supervisor, then summarized the 32 BCR projects authorized at that institution.

SKF and Steel Union Celebrate Agreement

Philadelphia

• • • **A recent agreement** between the United Steel Workers of America and SKF Industries, Inc., was followed by an unusual banquet at which 300 union shop stewards and foremen, union leaders and company executives were guests of the company.

The purpose of the dinner, it was said, was to celebrate the signing of the agreement and to foster the improved relationship reached during the negotiations. Prior to the agreement negotiations had been marked by bitter exchanges between both sides which culminated in a 12 weeks' strike.

William L. Batt, SKF president and former vice-chairman of the WPB, who was host at the dinner, said that the idea for the gathering came to him when, after negotiations failed locally, he met with Clinton S. Golden, USWA vice-president, and also a former vice-

chairman of the WPB. The two were able to successfully bring negotiations to a close.

"The foremen know what the company wants; the stewards know what the union wants," Mr. Batt said, and continued, "If the facts are made clear to each a fair conclusion must be reached. We of management will try to provide the atmosphere in which you may lay the foundations for good industrial relations."

Mr. Golden remarked that it "was most unusual for the president of a great corporation to take the initiative in suggesting the desirability of a joint meeting of foremen and shop stewards."

New Malleable Foundry Acquired by Harvester

Chicago

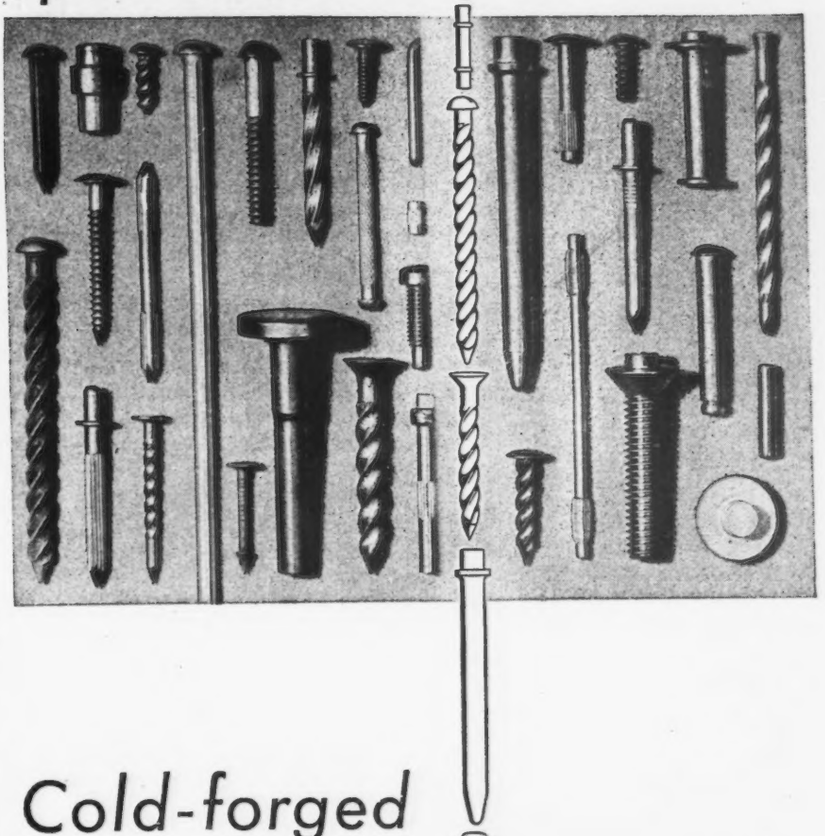
• • • **A malleable iron** foundry has been acquired by International Harvester Co. Approval of the sale of the government-owned equipment located in Waukesha, Wis., was given recently by the War Assets Administration. Harvester had previously taken over operations there on Feb. 1, 1946. It was indicated at that time that Harvester would open negotiations for the purchase of the government-owned foundry equipment in the plant.

The purchase price for General Malleable Corp.'s land, buildings, equipment and inventory, including work in process, was $496,000. Harvester has already spent considerable sums in plant rehabilitation and with the acquisition of the equipment, which cost $550,000, its total investment in this foundry will amount to approximately $1¼ million.

The aluminum and gray iron foundry of the plant was not included in the sale to Harvester. This business will continue to be carried on by General Malleable Corp. at Waukesha.

R. P. Messenger, Harvester vice-president, in charge of its farm implement division, said that the new plant should materially aid Harvester in supplying its own casting requirements, which has been one of the bottlenecks in implement production.

Specialties



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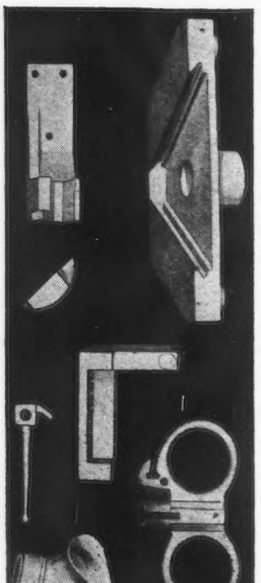

An OPEN LETTER on

MODERN PRECISION CASTING

If you are now producing small metal parts by conventional methods of casting, forging or machining, you may be able to realize substantial savings in production costs by using precision casting methods.

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Precision casting is being used today to produce a wide range of parts in ferrous and non-ferrous metals including high temperature alloys and varying in size from a fraction of an ounce to several pounds.

Compared to other industrial equipment, the cost of a complete precision casting plant remains surprisingly low.

As a dealer in precision casting equipment and supplies we offer detailed information to set up and operate a precision casting plant for your production.

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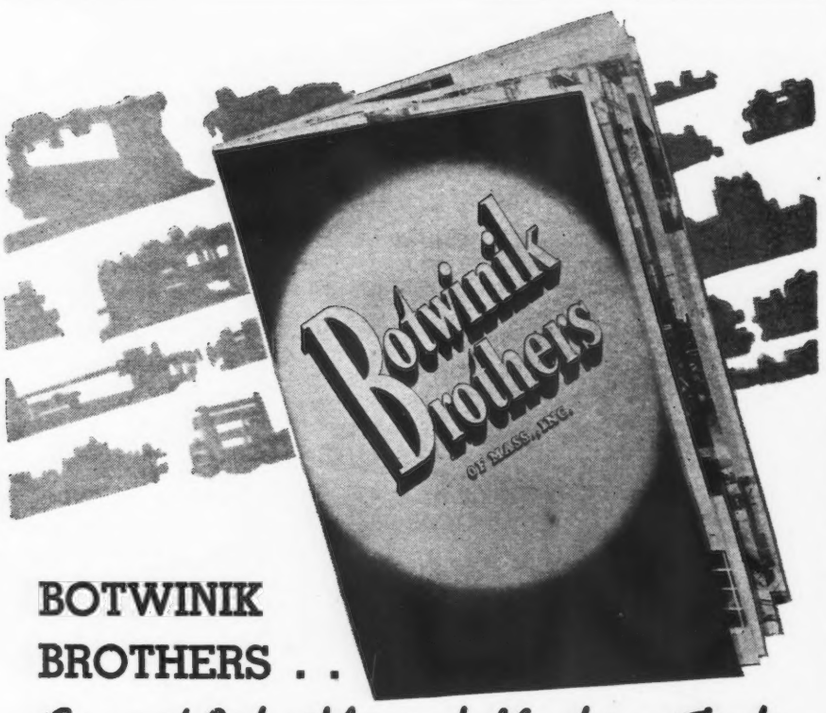

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Westinghouse Reports Substantial Gains In Appliance Production

Pittsburgh

• • • **Evidence that an important** section of the nation's electrical manufacturing industry is making rapid strides toward overcoming strike-enforced production delays and material shortages to meet the requirements of users of both household appliances and heavy industrial equipment was disclosed recently by Gwilym A. Price, president of the Westinghouse Electric Corp., who stated that his company's Electric Appliance Div. is now turning out approximately 1000 refrigerators a day—about 50 pct of its normal prewar output—and is even exceeding its prewar record production of electric irons and toasters. Production of these smaller appliances is running at approximately 3000 units a day.

Mr. Price reported that Westinghouse received $191,817,000 worth of new orders in the first five months of this year. This new business brought the company's backlog of unfilled orders at the end of May to $421,979,000.

Good progress now is being made in converting this backlog into sales billed, Mr. Price said. If the company's plans are not upset by shortages of materials furnished by its outside suppliers, it is hopeful of substantially exceeding full prewar output of all electric appliances now in production by the end of the year.

Equally encouraging progress has been made during the past six post-strike weeks in accelerating production of heavy industrial apparatus despite the handicap of severe shortages in some categories of steel and copper, Mr. Price said.

Asks New Proposals To Lease S. Chicago Plant

Washington

• • • **WAA recently** called for new proposals to buy or lease the South Chicago steel plant now under interim lease to the Republic Steel Corp. Bids for the plant were opened on May 1, but were rejected on the grounds that it would be possible to obtain a greater number of bids. There were two bidders.

Republic offered to lease the

property for five additional years with option to renew for either 5 or 13 yr and privilege of outright interim purchase at a predetermined price. At its own expense Republic offered to substitute a number of openhearth furnaces for the existing electric furnaces which would be stored against emergency requirements.

The Central Steel Tube Co., Clinton, Iowa, offered a flat sum of $17.5 million, to be paid within 2 yr by a corporation yet to be organized.

Henry J. Kaiser, who had been expected to bid, sent a letter to WAA saying that since the Chicago plant was built for heavy munitions and aircraft steel, it would not be suitable for his purposes.

WAA said when it appears that negotiations will result in a reasonable return to the government, a cut-off date for any further negotiations and the delivery of negotiated bids will be established. All interested parties, it was added, will be given advance notice of this date.

Plans Premium Payments

Washington

• • • **Housing Expediter** Wilson W. Wyatt has revealed that four more premium payment plans, each covering critical building materials and including cast iron soil pipe, have been formulated and if instituted will be retroactive to July 1. It was pointed out, however, that release of these plans is contingent upon what happens to price control and price movements.

At the same time, Mr. Wyatt said that a premium payment for pig iron and designed to bring into production selected high-cost furnaces has been outlined but that it had not yet been submitted to the industry advisory committee.

Three building material subsidies, all of which went into effect last month, will remain in force at least through July, the housing expediter added. While there is no present intention of cancellation at the end of July, the long range future of $400 million subsidy program is dependent upon whether price control is reestablished as well as price movements in industries earmarked for premium payments, he said.

Savage Tool Company—Savage, Minnesota Reports

100,000 PRECISION GAGES RUST-PROOFED WITH TECTYL

At the Savage Tool Company, where Do All Gages are made to the most exacting precision standards, even a microscopic bit of rust on the finished product cannot be tolerated. Savage reports "the number of rejects from rust has been very, very small".

Recently, a few sets that had been in inventory in different localities for more than a year were returned to the factory and found practically perfect.

Save Your Valuable Precision Tools with Tectyl.

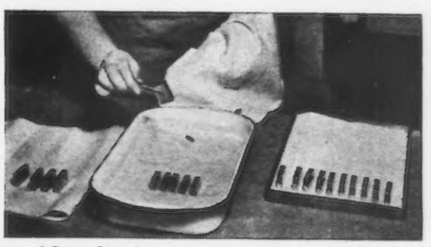
Processing of precision tools with Tectyl, after use, and before returning them to the crib, will keep them safe against rust and corrosion, even during long periods of disuse.

Tectyl gives complete protection in fresh or salt-air atmospheres—can be easily removed with kerosene at any time. Tectyl can save you thousands of dollars in costly replacements and production tie-ups.

What is your rust problem?

If you have a rust problem to solve—whether on tools, machinery or materials-in-process—our engineers will gladly advise you without cost or obligation.

Any information you give will be kept in strict confidence. Please describe in detail types of metals, character of rust exposure encountered and any production operations involved. *Write—phone or wire today for a special analysis of your rust prevention needs.*



1. *After final processing, gages are dipped in soda bath—removed with forceps—placed on cloth to dry.*

2. *Still using forceps, gages are then dipped in small dish of Tectyl 511 to remove all traces of moisture.*

3. *In final step, Tectyl 506 is applied with fingers. Gages are now safe against rust and corrosion in any climate.*

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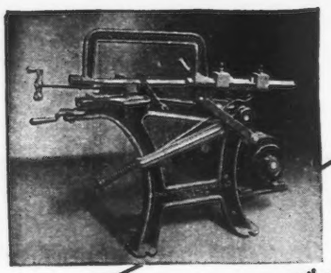

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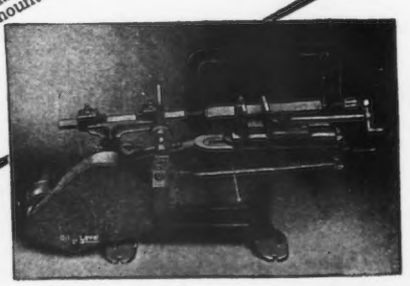

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Armco Has Plans For $69 Million Expansion

Middleton, Ohio

• • • **Plans for expansion** and improvements to the end of 1949 will cost $68,700,000, Charles R. Hook, president, American Rolling Mill Co., has announced. In 1945 the company spent $17 million on additions and authorized expenditures of $27,200,000 for 1946. Of this sum $12,705,000 was utilized in the first quarter, Mr. Hook said.

The company's complete program calls for new processes and machinery for the manufacture of stainless steel sheets and strips and other products, and for an increase in its Butler, Pa., facilities for manufacture of aluminized steel.

New soakage pits are planned for Middletown, Ohio and 25 new coke ovens will be built at Hamilton, Ohio. A new bar mill and some finishing equipment are planned for the Rustless Steel plant at Baltimore.

A merchant mill will be built at the Kansas City, Mo., plant. Expansion plans have also been formulated for Armco International Corp., in various parts of the world, notably in South America.

The management hopes to be able to purchase the government owned Houston, Tex., plant operated during the war by Sheffield Steel, an Armco division. The Houston plant has 47 coke ovens, a 247,000-ton blast furnace, and two openhearths with 186,000 tons annual capacity. There is also a blooming mill, a plate mill and various Armco-owned facilities.

Publishes Pictorial Automotive History

Cleveland

• • • **"A Chronicle of the** Automotive Industry in America—1893 to 1946," recently prepared for private circulation by Eaton Manufacturing Co., Cleveland, is apparently one of the most complete histories of the automotive industry yet to appear in this form. The book, which is a revised edition of a similar chronicle published by Eaton 10 yr ago, is a combination salute to the automotive industry Golden Jubilee and Eaton's own 35th anniversary. It presents year-by-year highlights of automobile

history in America, beginning with America's first gasoline engine-driven motor vehicle which was designed by Charles Duryea and built and driven by his brother Frank in 1893.

The book is illustrated with many photographs of early experiments which recall memories to old timers who remember the beginnings of the automobile industry. Illustrations picture the first, or early models of practically all cars which were manufactured on a production basis, as well as all 1946 cars and trucks.

A day-to-day review of the industry's war activities and photographs of principal combat and service vehicles is, it is stated, the first "all in one place" chronicle of this period in the industry's history.

Westinghouse Builds New Midwestern Plant

St. Louis

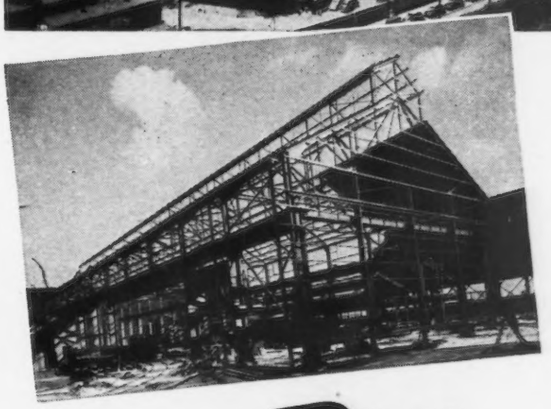
• • • **The Westinghouse** Electric Corp. has started construction of a new plant, warehouse and office building at St. Louis, H. F. Boe, vice president, announced.

Production of switch boards, panel boards and other electrical controls will be transferred to the new plant by Nov. 1, barring a lag in the delivery of building materials.

The two buildings will cover approximately 135,000 sq ft of floor space, compared to 75,000 sq ft at the present location and in outside warehouses. Approximately 240 persons will be employed under the new organization, with most of them being shifted from the present location.

"Under contract to Grove, Shepherd, Wilson & Kruge, Inc., of St. Louis, the two buildings are being designed along the most modern lines. The property purchased gives adequate allowance for future expansion," Mr. Boe pointed out. "The plant is being laid out for the most efficient production based on studies by the company's building construction and maintenance department."

The repair section of the plant will be given over to the rejuvenation of diesel electric motors and generators for railroads, light traction apparatus, and transformers and rebuilding of motors for mills and shops.



↑ Jones & Laughlin Steel Corp., Strip Mill, Pittsburgh, Pennsylvania.

← Great Lakes Steel Corp., No. 3 Slab Yard Building. Ecorse, Detroit, Michigan.

Fort Pitt Bridge...

HEADQUARTERS FOR NEW IDEAS IN INDUSTRIAL CONSTRUCTION

The old, unsightly factory is on the way to oblivion. In its place will be found a planned structure, streamlined in design, completely practical for faster, more economical production. Yes, it will be a structure of beauty, designed to harmonize with surroundings, adding value to the area in which it is built and to the community.

Fort Pitt Bridge has kept abreast with these new trends, cooperating with the architects and engineers. Many of these new ideas are incorporated in the new structural steel buildings for aircraft, chemical, steel, public utilities and other plant construction.

STEEL Permits Streamlining Construction with Safety, Endurance and Economy

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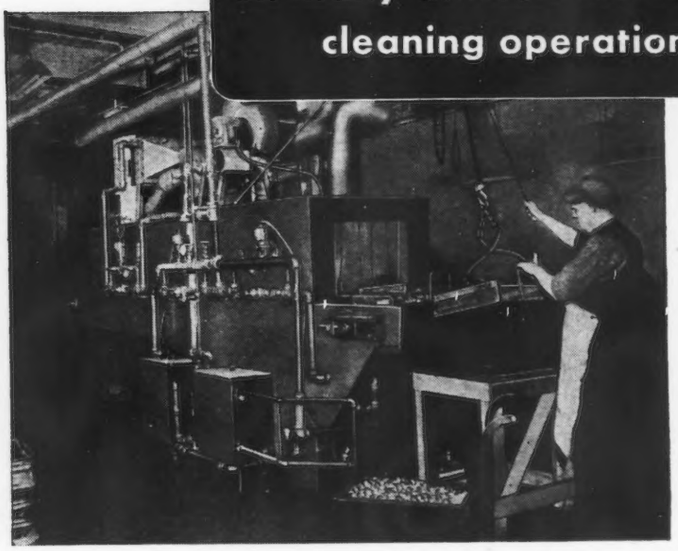
For HIGH OUTPUT
on many difficult metal parts
cleaning operations



OPTIMUS Flat Conveyor Type Spray Washing Machine handling brass screw machine parts and castings in bulk in large metal working plant.

THE OPTIMUS Flat Conveyor Type Spray Washing Machine will handle metal parts of almost any shape. It can be adapted to many different and difficult metal cleaning problems.

The output of this OPTIMUS Machine is high, with little labor required for loading or servicing. Most types of parts can be easily handled in it in bulk in baskets or separately on the conveyor. Special parts can be positioned, if necessary.

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Write today on your business letterhead for your copy of this new illustrated bulletin describing OPTIMUS Equipment and Dependable OPTIMUS Detergents for modern metal parts cleaning operations.

Handling a large amount of cleaning per square foot of floor space, this OPTIMUS Machine can be used for any metal cleaning or similar operations; alkaline, acid, solvent type, air drying, oil spray, etc. Available in all sizes with any type of horizontal conveyor.

An OPTIMUS Plan for the mechanized handling of your metal parts through washing, rinsing, drying and allied process operations, can help save labor costs, reduce rejects and increase your production. Investigate how the use of OPTIMUS Equipment and the accompanying Dependable OPTIMUS Detergents can be applied to your operations to your advantage.

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ENGINEERS AND MANUFACTURERS

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STANDARD AND SPECIAL TYPES OF EQUIPMENT FROM THE SMALLEST TO THE LARGEST SIZES FOR A WIDE VARIETY OF OPERATIONS.

OPTIMUS EQUIPMENT

FOR WASHING · RINSING · PICKLING AND DRYING OF METAL PARTS

Weekly Gallup Polls

(CONTINUED FROM PAGE 107)

All voters with an opinion were asked to give the reason for their views. Two main reasons were found among those expressing disapproval, first, that the President favored business too much and labor not enough, and second, that he showed too much favoritism toward labor. Other main objections were that he waited too long before acting, that he "lacked firmness" in handling the situation, and that he "played politics too much with the strike situation."

Those voters who applaud the President's handling of strikes say that he is doing the best he can with the difficulties facing him, that he has put men back to work, and that he has finally showed firmness in the face of labor opposition.

• • • With charges being leveled that Communists are trying to foment a maritime strike in September, how extensive does the public believe communism to be in the American labor movement?

Coast to coast questioning of voters by the institute reveals that the majority think there is a "great deal" or a "fair amount" of communism in the unions, and that the majority of union members think so, too.

The extent of communist influence in the unions is, of course, a matter of opinion even among experts most closely connected with the labor movement. The average American can do no more than form a general impression based on what he has heard or read. But there seems little question that his impression, whether correct or incorrect, is that communism is considerably more than a minor factor.

The public was asked this question in the poll:

"How much communism would you say there is in the labor movement—a great deal, a fair amount, only a little?"

The vote:

	Pct
Great deal	38
Fair amount	27
Little	16
None	2
No opinion	17

The issue of communism in the National Maritime Workers Union and the Automobile Workers

Union has frequently been discussed in the press, and CIO Chairman Philip Murray has been reported to be concerned over the handling of communist groups in the widespread CIO organization.

Conceptions of the extent of communism in unions differ somewhat from group to group in the population. Generally speaking, while a majority in each major occupation group think there is at least a fair amount of communism in the labor movement, people in business and professional groups, and farmers, are more apt to see communist influence in unions than either white collar workers or manual workers.

	Great deal Pct	Fair amount Pct	Little Pct	None & no opin. Pct
Prof. & bus.	42	30	18	10
Farmers	47	26	7	20
White collar	34	32	18	16
Manual workers	35	23	17	25
Union members only	30	28	22	20
By Education				
College	42	28	23	7
High school	38	31	16	15
Grade or no school	38	23	14	25

On the question of whether anything should be done about Communists in this country, the American public holds mixed views with a substantial number of voters reserving judgment. But the general weight of opinion is toward adopting strong measures to curb or regulate Communists and Communist Party activity.

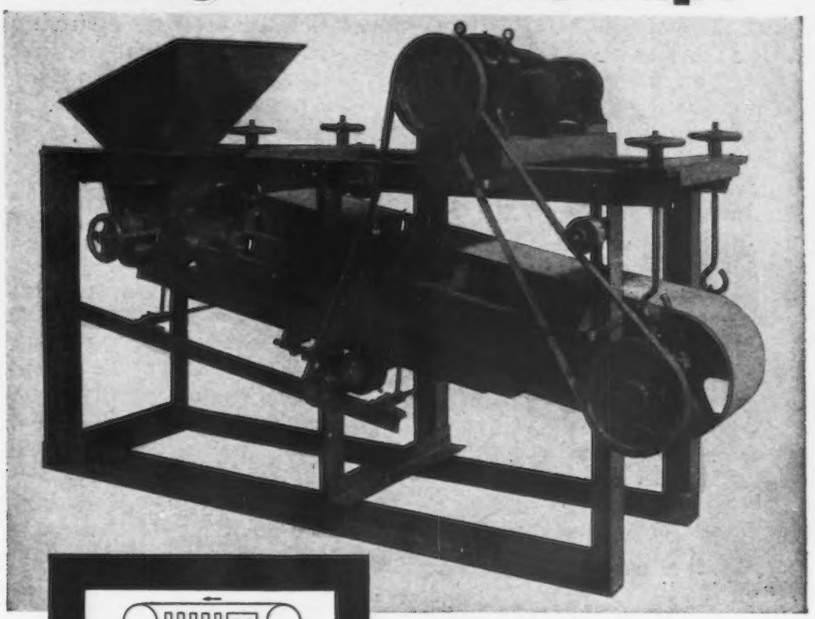
In the United States the Party has never polled much in the way of votes, being one of the very minor parties in terms of numerical strength. But the average American, perhaps with an eye on the development of communism abroad, does not feel very tolerant at this time toward American Communists, as the results show:

"What do you think should be done about the Communists in this country?"

The vote:

	Pct
Take strong measures (Get rid of them, report them, jail them, shoot them)	36
Curb them (Keep them out of public office, make it hard for them to be active)	16
Let them rave, but watch them	7
Do nothing	16
No opinion	25

Literally "JOLTS" Loose Tangled Metal Scrap!



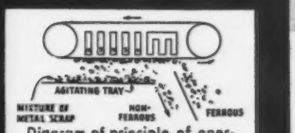
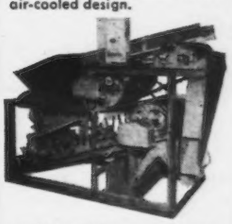


Diagram of principle of operation employed by Dings BN Separators.

Dings Magnetic Pulleys are used as head pulleys in a belt conveyor system. Bronze spacer rings, air-cooled design.



The Dings DA Separator for separating ferrous and non-ferrous scrap. Two High Intensity Magnetic Pulleys provide doubly clean separation.

Alnico horseshoe magnet used with finely divided magnetic sprinklings to inspect castings for flaws. 2½" wide x 3" high. Pole bases ¾" x ¾".

DINGS BN Separator

The Dings BN Magnetic Separator shakes and jolts loose such intimately entangled scrap as babbitt and cadmium borings from cast iron, steel turnings from brass borings, etc.

An agitating tray which tends to disentangle the scrap is located beneath an endless belt. Mounted between the belt pulleys are a series of powerful electromagnets having alternate polarities. Scrap is jolted from pole to pole, completing the disentanglement. Non-ferrous scrap falls back to the tray and is discharged, while ferrous particles are held to the underside of the belt and dropped off beyond the magnetic zone. Write today for complete details.

DINGS MAGNETIC SEPARATOR CO.

516 E. SMITH STREET MILWAUKEE 7, WISCONSIN

Dings MAGNETIC SEPARATION HIGH INTENSITY

World's Largest Exclusive Builder of Magnetic Equipment
Established 1899

London Economist

(CONTINUED FROM PAGE 111)

occur, all sorts of cloud-castles are built that cannot last.

The same sort of thing is happening now—to take only one instance from the *Fortune* article already quoted: "By 1947 the passenger capacity of the nation's airlines will equal that of the railroads in 1941." In a complex, modern, industrial economy, the sequence of slump upon boom is not something that may happen and may not, like measles and the chicken-pox. It is something that certainly will happen unless specific steps are taken to prevent it. And preventive steps are just what the American people, as represented by its politicians, has just refused to take.

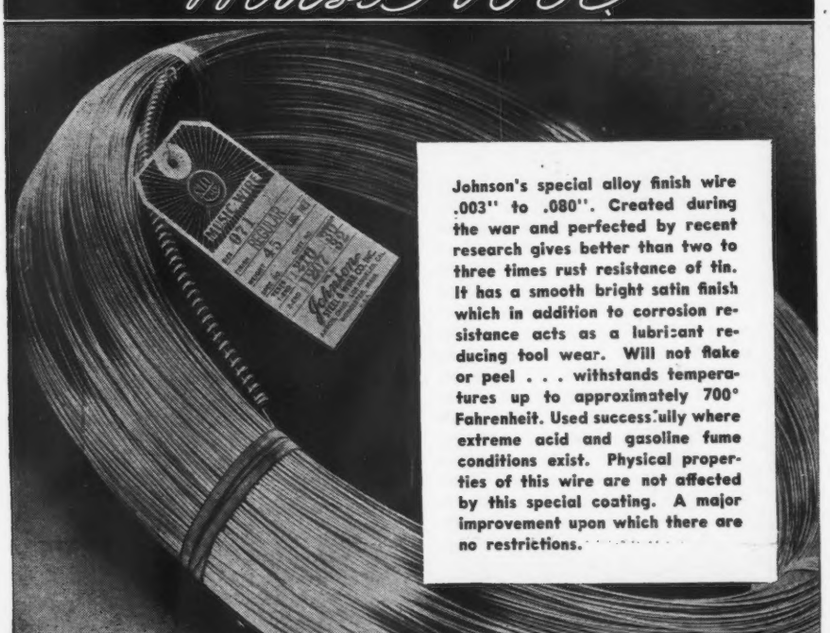
IN any case, it is not necessary for those who are looking on helplessly from the sidelines to base their calculations upon the inevitability of an American slump. There may not, after all, be a slump, or it may only be a short and shallow one, as in 1921, or the government, though inhibited from doing anything about it in advance, may move quickly and effectively to stop it when it comes. Each of these alternative theories is tenable. But one thing is quite certain: the boom will not go on forever. Some day the buying spree will be over. Some day inflation will cease to be the danger and the American economy will have to face its more permanent enemy, deflation. Some day the proportion of the total of American incomes that is spent on consumption will fall back to the normal figure and the problem will then have to be faced of finding means whereby the unspent portion can be absorbed without deflation and unemployment—that is, some means whereby savings can be turned into spending on capital formation and the flow of the national income thereby maintained.

No one can say for certain when that time is coming; but it will certainly come. No one can say for certain what will happen when it comes; but nothing that is happening now alters the previous conclusion that it will be a very difficult problem for an uncontrolled economy, with a noncohesive and nonresponsible political system, to solve. On the contrary, unless all the old rules have been revoked, it is still a prudent presumption that the higher the rocket goes the further the stick will fall.

Moreover, it is not enough for outsiders merely to feel sure that, when the critical time comes, the American Government will take effective steps to keep up the flow of the national income. A great deal depends, for us, on how it is done. For example, it is significant that virtually every plan for achieving this that has been published in America places great reliance on a large export surplus of $3 billion or even more. Whether financed by loans or not, an export surplus of this order, at a time of oncoming slump, would wreck the export markets of the world. The easiest way for any nation to get rid of threatened unemployment is to pass it on to its neighbors, and if Congress were suddenly faced with the necessity of doing something to head off a slump, could it think of anything politically more attractive or technically easier than to cut imports and subsidize exports? The apprehension that outsiders must feel about the absence of an agreed anti slump policy in America (as distinct from a lot of talk about the necessity of full employment) is compounded equally of the fear that, when the time comes, Congress will do nothing effective, and partly of the fear that it will do the wrong things. The recent moods and actions of Congress have not been such as to remove these fears.

If, next week, the House of Representatives approves the loan to Britain, there can be no turning back on our part. We are committed beyond recall, for good or for evil, to marching in step, so far as we can, with the American economy. But the evidence that has accumulated since the loan was negotiated, and its conditions determined, nearly a year ago, does give us the right to ask the Americans for some tangible proof that they are not leading us back to 1929.

JOHNSON XLO Music Wire



Johnson's special alloy finish wire .003" to .080". Created during the war and perfected by recent research gives better than two to three times rust resistance of tin. It has a smooth bright satin finish which in addition to corrosion resistance acts as a lubricant reducing tool wear. Will not flake or peel . . . withstands temperatures up to approximately 700° Fahrenheit. Used successfully where extreme acid and gasoline fume conditions exist. Physical properties of this wire are not affected by this special coating. A major improvement upon which there are no restrictions.

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